5517

RECORD COPY

OTS: 60-41,329

JPRS: 5517

29 September 1960

HERALD OF COMMUNICATIONS

(VESTNIK SVYAZI)

No. 6, 1960

- USSR -

Distributed by:

OFFICE OF TECHNICAL SERVICES
U. S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

Price: ~~$3.50~~

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
205 EAST 42nd STREET, SUITE 300
NEW YORK 17, N. Y.

JPRS: 5517

CSO: R-4695-N

HERALD OF COMMUNICATIONS

No. 6, 1960

[Following is the complete translation of Vestnik Svyazi (Herald of Communications), issue No. 6(243), June 1960. Both covers and the Table of Contents of this Russian-language publication were included in the translation.]

NOTE: In order to expedite its issuance, this publication has been printed directly from the translator's typescript, after a minimum of retouching, cropping and make-up.

This translation has been printed on one side only because the available mimeo paper stock was unsuitable for standard two-side impressions.

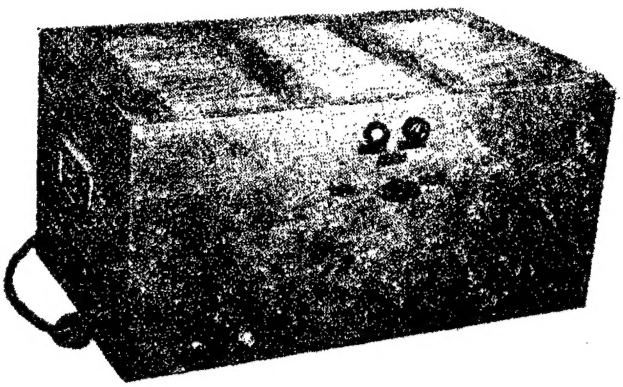
INNOVATIONS IN COMMUNICATIONS EQUIPMENT

* * *

LOW FREQUENCY RECTANGULAR PULSE GENERATOR WITH LINE FREQUENCY GATING

The generator produces a test signal intended for checking the transient response of a television system in the low video-frequency region. The signal takes the form of field-frequency symmetric rectangular pulse, gated by the horizontal quench and sync pulses. This is the test signal recommended by the CCIR for determining the quality characteristics of television channels.

The instrument was developed in the Scientific Research Institute (NII) of the Ministry of Communications of the USSR.



* * *

"ADMIRAL" TELEVISION RECEIVER

At an exhibition of the achievements of the national economy, the "Admiral" television receiver is being demonstrated. This set is a high-quality television console designed to receive television programs in the 49 to 223 Mc band, as well as ultrashortwave FM broadcasts.

The set has 21 tubes and 19 semiconductor diodes. The dimensions of the image on the screen of the 110° rectangular tube are 475 mm x 360 mm. The seven-speaker system of the receiver provides high-quality sound reproduction.

Remote control of the receiver is accomplished with a special extension panel. The set draws 200 watts from the line.

* * *

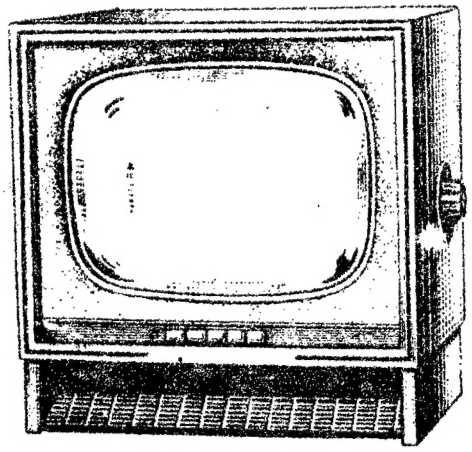
THE "RUBY-104" TELEVISION RECEIVER

The radio industry has developed the model "Ruby-104" television receiver. The set is designed to receive television programs on any of 12 channels, as well as UHF FM broadcasts in the 64.5 to 73 Mc band.

The set can be turned on and off, and specially selected sound characteristics chosen, with pushbuttons. The latter correspond to the basic qualities of the programs transmitted ("speech", "concert", "mellow sound"). Brightness and volume can be controlled from an extension panel.

The receiver has 22 tubes and 12 semiconductor devices, and a type 43LK6B 110° rectangular tube.

The receiver circuit incorporates the latest achievements in television-receiver technology, as a result of which its operation is distinguished by high stability and a high-quality image. The receiver wiring occupies three printed-circuit boards.



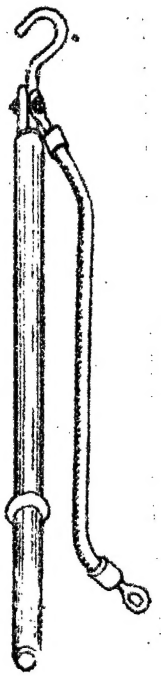
* * *

THE KRR-1 DISCHARGE HOOK

By using a discharge hook, it is possible to remove a residual potential and carry out protective grounding of busses or other current-carrying portions of various installations with high-voltage equipment up to 12 kv. The hook is a way of safeguarding the maintenance staff from high-voltage dangers.

The discharge hooks consist of an insulated rod, a hook, and a flexible insulated grounding conductor with lugs.

The design for the KRR-1 discharge hook was developed in the Central Design Bureau (TsKB) of the Ministry of Communications of the USSR.



* * *

HERALD OF COMMUNICATIONS

Monthly Industrial-Technical Journal of the USSR Ministry of Communications and of the Central Committee of the Trade Union of Communications and Automotive and Highway Workers

No. 6 (243)

June 1960

(twentieth year of publication)

CONTENTS

The Conference on the Introduction of New Techniques, Automation and Mechanization into the Industrial Practices of Cable Trunk-Lines

A four-day conference of engineers, technicians, workers, production rationalizers, and research workers of the managements of cable and radio-relay trunk lines was convened in Moscow by the USSR Ministry of Communications. The conference was devoted to the problems of the introduction of new techniques, automation, and mechanization in the industrial processes of cable and radio-relay trunk lines.

The USSR Deputy Minister of Communications, I. V. Klokov, opened the conference.

The participants at the conference heard and discussed the following reports: "Measures for the introduction of new techniques, automation, and mechanization of industrial processes on cable trunk lines" by I. P. Petrushin, the chief engineer of the GUMTTS (Main Administration of Interurban Telephone and Telegraph Office); "The automation of cable trunk lines under construction" by the supervisor of the technical department of the "Giprosvyaz" (State Institute

for Communications), P. P. Yatsenko; "A System of remote control and signalling on operating cable trunk lines, without signal wires" by the supervisor of the KONIIS' laboratory (KO Scientific-Research Institute of Communications(*)), A. V. Sheremetyev; "Automation of power-supply stations at the interurban telephone and telegraph communications offices" by the chief power engineer of the Technical Administration of the USSR Ministry of Communications, G. S. Lyubskiy; "Qualitative work indicators for communications channels on cable trunk lines" by the chief engineer of the TsMTS (Central Interurban Telephone Office), P. T. Gobets; "A System of Communication on Single-Quad Cables Involving the Use of K-24 and K-60 Semiconductor-Triode Amplifiers" by the senior engineer of the TsNIIS laboratory (Central Scientific-Research Institute of Communications), O. D. Pustovoytenko; the supervisor of TsNIIS laboratory, M. I. Mikhaylov, reported on the topic "Protection of communications cable lines against interfering and harmful effects."

The conference also heard a number of reports and papers on recent technical developments in the field of automation and mechanization of cable trunk lines.

(*) Translator's note: KO is not identified in standard sources.

The participants at the conference shared their experience with respect to the automation of cable and radio-relay trunk lines, and also discussed their experience in the modernization of cable-line and office construction and equipment; in addition, they discussed the introduction of a unified method of servicing line and office facilities. They also spoke of the work they had done on the mechanization of difficult and labor-consuming processes in the repair and servicing of line facilities--this work involved the maintenance of the proper gas pressure in the cables and the spotting of points where the lead sheath of the cable was no longer airtight, etc.

Sections at the conference dealt with individual problems, and the conference adopted the recommendations which were directed at the further introduction of new techniques on cable and radio-relay trunk lines, and which would serve to improve the technical and operational servicing of these lines.

The delegates to the conference were shown an exhibition of models and actual pieces of automation and mechanization equipment that is used on the cable trunk lines.

A USEFUL UNDERTAKING

In order to speed up the movement of mail, the workers' collective of the Ordynsk Rayon Communications Office of the Novosibirsk Oblast undertook the socialist responsibility of training five workers at their office in the procedure of sorting correspondence and periodicals by the communications departments of the rayon. This will make it possible to use at least two people to process the incoming mail from the oblast center, and thus to cut the processing time in half.

Moreover, the collective undertook to set up, in the communications office, a checkpoint staffed by party members and members of the trade-union and komsomol organizations, and this group will keep tabs on the daily maintenance of work schedules (deadlines) with respect to the sending and delivery of mail and telegrams. It was decided toexamineeach case in which these deadlines were not met at a production meeting, and to adopt those measures that would eliminate these shortcomings.

The communications workers of the Ordynsk Office, taking into consideration that fact that the acceleration of the mails depends not only on the careful and conscien-

tious functioning of a single office, turned to all of the workers of postal communications in the oblast and urged them to reduce the time which they spent on processing mail and printed matter at their enterprises.

II TRADE-UNION CONFERENCE OF COMMUNICATIONS AND AUTOMOTIVE AND HIGHWAY TRANSPORTATION WORKERS

* * *

We have already reported in Issue No. 5 of our journal that the II Trade-Union Conference of Communications and Automotive and Highway Transportation Workers was held on 19-20 April.

What follows below is a brief account of the work of the conference (a discussion of the problems encountered by the trade-union organizations of the communications enterprises).

From the Report of B. G. Romanov, the Chairman of the Central Committee of the Trade-Union.

The communications and automotive and highway transportation workers are striving with great enthusiasm to carry out the decisions of the XXI Party Congress. During the first year of the Seven-Year Plan, the enterprises of the USSR Ministry of Communications exceeded the production volume anticipated under the program by 3%; the labor productivity anticipated under this program was exceeded by 3.5%.

The productive achievements of our enterprises are, for the most part, a result of the expansion of socialist competition. The supervision of this socialist competition was improved upon by many regional trade-union committees, primarily the Stalingrad, Stavropol', Khabarovsk, Leningrad, Byelorussian, Voronezh, and the City of Moscow regional trade-union committees.

Among the collectives of the enterprises in our trade union, approximately 25,000 (with a membership of over 200,000) are competing for the title of "Brigade of Communist Labor"; over 80,000 workers are striving for the title of "Shock-workers of Communist Labor." These honors have already been achieved by 3,000 brigades and 11,000

shock-workers.

An important goal of competition is to raise the level of those who are lagging to the level of those at the top. Following the example set by Valentina Gaganova, many communications workers transferred to departments which were lagging, and within a short time, raised these to the top.

However, certain economic and trade-union leaders are not devoting enough attention to the advancement of the brigades and shock-workers of communist labor; nor are they devoting adequate attention to the study, generalization, and dissemination of the experience gained by the leading collectives and workers. It is precisely for these reasons that there is little competition for these important titles at the communication enterprises of the Uzbek, Turkmen, Armenian, and Tadzhik SSR's.

The trade-union organizations are responsible for, and play an important part in, technical progress, incorporating scientific and technical advances into industrial practice as quickly as possible, utilizing all possible industrial resources, etc; these responsibilities combine to form the basis for the further rise in labor productivity. The trade-union organizations must pay particular attention to the rate of completion of the programs for the

introduction of the new techniques, automation, and mechanization of industrial processes.

Researchers and production ratipnalizers can make a great contribution to the successful completion of the Seven-year plan. The trade-union committees of the Ukrainian, Kazakh, and Latvian republics, as well as the the trade-union committees of Moscow (both city and oblast), Sverdlovsk, and many other cities, have done much to improve the work of their production rationalizers and researchers.

The communications enterprises frequently hold public inspections of the production rationalization and research operations; in addition, they hold technical conferences and conventions where an exchange of ideas is possible.

But even here we see more serious shortcomings. In a number of republics during the past year there has been a drop in the number of accepted rationalization proposals. The trade-union organizations, and primarily the local organizations of the All-Union Society of Production Rationalizers and Researchers, must support the mass explanatory work of the rationalizers and researchers, and provide them with the necessary conditions for their effective functioning.

The most important and most effective manner of

enlisting the workers' and employees' cooperation in production control is the permanently convened production conferences, which have recently been very active. During 1959, more than 200,000 suggestions were submitted at these conferences; of these suggestions, more than 80% were adopted and put into effect.

However, in a number of republics, krays, and oblasts, these permanent production conferences are not functioning properly. For example, in the Turkmen SSR only 188 suggestions were offered during the second half of last year, i.e., on the average, slightly better than two per enterprise. The situation is the same for a number of other republics.

Collective agreements are important in the mobilization of the workers to complete their assigned tasks; moreover, these agreements serve to increase the responsibilities of the management groups to create normal industrial and living conditions for the workers. However, many enterprises still underestimate the importance of these collective agreements, and the trade-union organizations do little to administer the carrying-out of these responsibilities. We must take decisive steps to correct this situation, i.e., we must make strict demands

upon the management organizations to carry out their responsibilities under the terms of the collective agreements.

The trade-union organizations have played an active part in the development of the forthcoming production programs. During one of its sessions, the Presidium of the Central Committee of the Trade Union discussed a report from the Ministry of Communications which dealt with the economic indicators of the projected program for the development of communications facilities during the years ars 1959-1965. The future programs for the development of the means of communications in the republics, oblasts, and enterprises, were discussed at the general and presidium sessions of the trade-union committees of the republics and oblasts.

The Central Committee of the Trade Union, having carried out the decisions of the previous session convened in 1958, turned to the formulation of measures designed to adjust pay scales and to prepare the enterprises for operations on a seven-hour day basis. The organizations of the trade unions and management must now combine their efforts to familiarize all the communications workers with the new pay scales. Each worker must be made to realize that the adjustment of pay scales is closely associated with the need to make the best pos-

sible use of resources, to operate equipment at fullest capacity, to be persistent in introducing new techniques, to disseminate top-flight experience, to improve the scheduling of work at the enterprise, and to improve the organizational and technical aspects of the management of this schedule.

The schedules for the transition to a seven-hour day were prepared and put into effect for the communication enterprises, and reading material was distributed for the guidance sessions that were to be conducted throughout the enterprise. The most active members of the trade-union and economic organizations conducted these guidance sessions in Moscow, Khabarovsk, Leningrad, Novosibirsk, Kharkov, Sverdlovsk, etc. In the majority of the republics this transition to the shortened workday by the communications enterprises was accomplished on time.

The first session of our trade union, in its decisions, stressed to the trade-union committees and management organizations the necessity for labor safeguards, and for the elimination of /the causes of industrial accidents and occupational diseases. The central committee of the trade union began to pay greater attention to the problems and techniques of labor safeguards. Many enterprises have improved the medical and

hygiene facilities for the working force, and they have mechanized the difficult and laborious operations. During the period, the number of first-aid stations at our enterprises was increased by better than 40%. The working conditions of individual labor categories were improved. Additional leaves were granted to construction and repair workers at radiofacility construction sites, to mail clerks, and to the workers of some other professions.

In 1959, a great number of our enterprises reported a drop in the industrial accident rate. However, this slight improvement is by no mean enough to satisfy us. Individual planning organizations, as before, still tolerate gross errors in their plans, as well as deviations from the effective norms and safety rules, and from the requirements of medical care. The trade-union organizations must do everything in their power to insure that the newly constructed industrial facilities meet all of the requirements of the labor safeguards and safety techniques.

Everything is being done in our country, to achieve, within the next few years, a complete solution to the housing problem. Each year additional funds are set aside

for housing construction. However, the need of the communications workers for housing is still very great.

It is well known that the economic organizations, having made profits above those anticipated by the plan, have the right to assign up to 30% of these profits to housing construction. This will make possible a considerable improvement in the housing conditions of the communications workers. However, many enterprises make extremely unsatisfactory use of the funds set aside from the excess profits. Moreover, the USSR Ministry of Communications reports that on the whole these funds have remained unused during the past two years. The trade-union organizations must therefore oversee the construction of each housing project, making it available for occupancy on schedule; further, they must take charge of the distribution of housing sites. The trade-union organizations must give wholehearted support to individual housing construction, offering help to those building their own homes.

Recently, our trade-union organizations have begun paying greater attention to the education of our workers in the communist relationships to labor, to the development of collectivism, to friendly cooperation, and in the communist standards of behavior in everyday life. The lectures, reports, and discussions of the most import-

ant problems in the political life of the country were more closely related to the life of the enterprise, rayon, oblast, kray, and republic. The universities established in Moscow, Leningrad, L'vov, and other cities serve to widen the cultural horizons of the workers.

Yet this educational work still suffers from certain fundamental shortcomings. Therefore we still find cases of money-order embezzlement and loss of mail by communications workers. Every social effort must be exerted to eliminate these disgraceful phenomena. For this purpose, the work of clubs, Red Corners (1), libraries, the press, and the radio, must be put to effective use. The function of general meetings, industrial conferences, and comrades' courts as organs of influence over undisciplined persons must be strengthened.

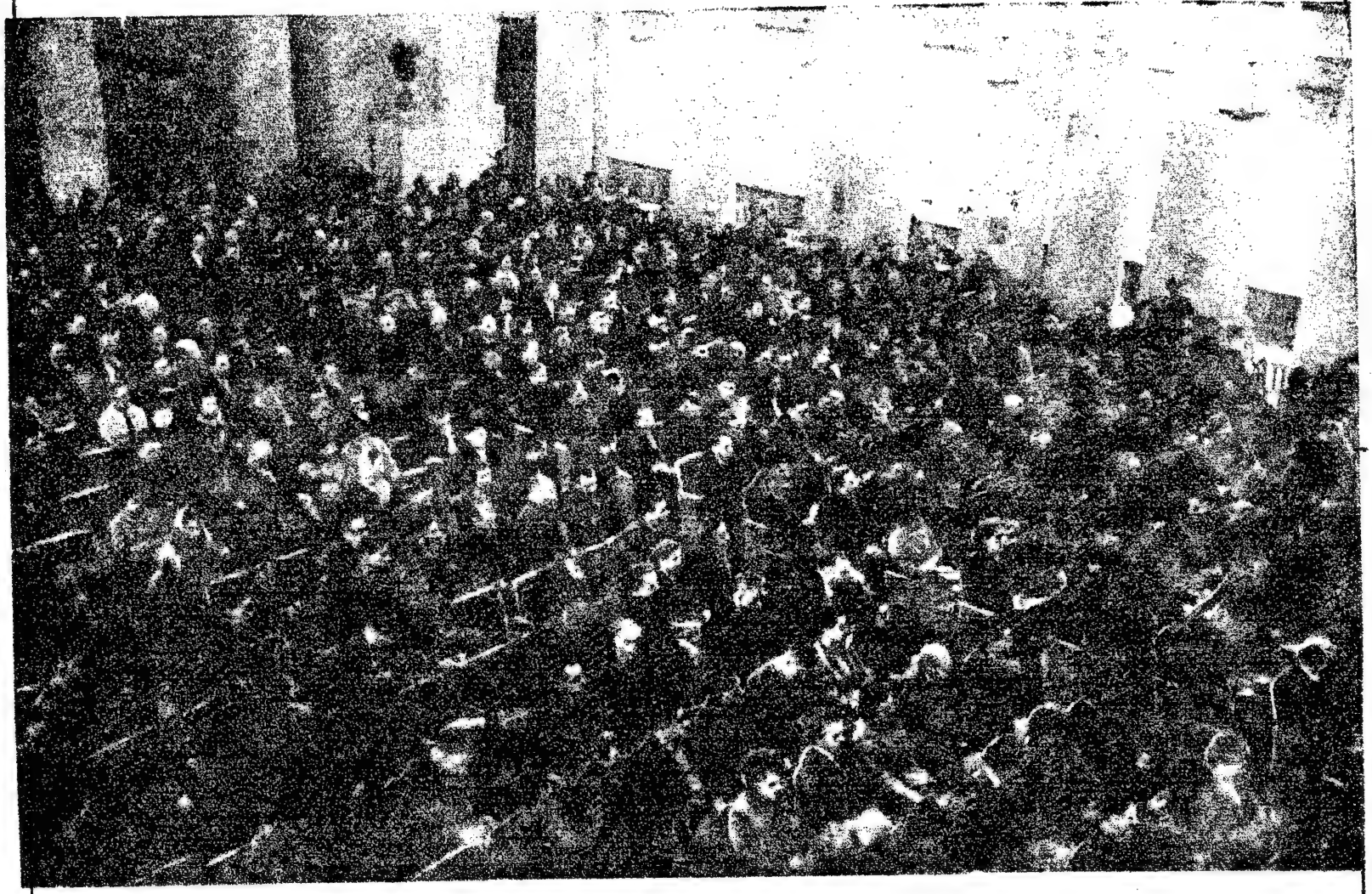
During this period, our trade unions increased numerically and became organizationally stronger. At the present time, the union carries 2,515,000 workers and employees on its membership rolls, and these members are grouped into 15,000 local trade-union organizations. This is an increase of 740,000 people over the count prior to the first session.

(1) Translator's note: a Red Corner is a room reserved for educational or recreational needs in institutions, factories, etc.

The Central Committee of the Trade Union held six general sessions which directed the trade-union organizations to carry out the assignments of the party, government, and the All-Union Central Council of Trade Unions, as rapidly and as fully as possible. The trade-union committees achieved a slight measure improvement in their practical management of local organizations and active workers, and they began to pay greater attention to the industrial productivity of the enterprises.

However, there are still a great number of shortcomings in the work of many local organizations. Quite often, the local committees deal only with passing on applications, passes, sick pay, etc., without taking advantage of the great rights and possibilities which are open to them. They are not active enough in encouraging the membership to participate in social activities, their management of trade-union groups is unsatisfactory, and they rarely convene general meetings for the entire membership of the trade union.

A number of shortcomings are also to be noted in the operations of the presidium and and departments of the Central Committee of the Trade Union. The presidium of the Central Committee maintains too little control over the actual carrying out of the



In the Conference Hall

decisions of the VTsSPS (All-Union Central Council of Trade Unions); moreover, they do little to carry out their own decisions, i.e., organizational work, adequate practical assistance to all trade-union committees. There are also many shortcomings in the procedures for handling mail and grievances of workers. There are unnecessarily long delays in replies to letters and applications.

At the end of his report, Comrade Romanov announced with respect to the international activities of the CC of the Trade Union that after the first conference, ties with their counterparts in the Chinese People's Republic, the Czechoslovak People's Republic, and in many other socialist countries, had been established and strengthened. In 1958-1959, contact was established with the ₮ trade unions of Indonesia, India, Burma, Japan, Brazil, Uruguay, Mexico, Chile, and other states. The activities of the CC of the Trade Union were directed toward the joint action of the international workers and trade-union movement, in their struggle to improve the living conditions of the workers, and to work for peace among nations.

The Presidium of the II Trade-Union Conference of Communications and Automotive and Highway Transportation Workers. On the dais, the Chariman of the Central Committe of the Trade Union, B. G. Romanov.

From the Delegates' Addresses to the Conference

Twenty-three delegates to the conference discussed the report of the Central Committee of the Trade Union.

The Chairman of the Ukrainian Republic Trade-Union Committee, Comrade Gorelov, noted that the communications workers of the Ukraine had successfully completed the plan for the year 1959 and for the first quarter of this year. Just during the first quarter of 1960, the income anticipated under the plan was exceeded by 6 million rubles. Other assignments under this plan were also exceeded, and the quality of the workmanship was improved. The widespread socialist competition among the communications workers played a decisive role in this; we have particular reference to the role of the competition for the titles of brigade and shock-worker of communist labor.

The number of collectives and individual workers who have already attained these honored titles is growing. The switch-room team of the Simferopol Telegraph and Telephone Office, headed by senior technician Comrade Kramorenko, is living and working in the communist manner. The equipment assigned to this team is maintained in excellent condition, and all long-distance telephone calls are carried

with good or excellent audibility. The members of the team are active in the social life of their collective, they are increasing their technical knowledge, etc. For the second year in a row this team has been designated a communist brigade. This title has been held for more than 18 months by a team of komsomol-mailmen from the Kiev postoffice. Of these, three are attending school. The leader of this team, Lyuba Kadegrop, has completed the ten-year school, and is preparing to enter a higher educational institution. She has trained four girls in the latest working methods, and has trained Galya Letko to assume the responsibilities of a team leader; Lyuba Kadegrop, herself, has transferred to a brigade that is lagging. Now all of the 58 workers of the delivery department are striving for the title of "Collective of Communist Labor."

Comrade Gorelov went on to report that the trade-union and management organizations of the enterprises have been very active in handling the transition of the communications workers to the reduced seven-hour workday. The transition to the seven-hour workday became possible, on the whole, only through economies

which were achieved as a result of introducing the latest techniques, adjusting norms, reducing manhour losses, combining skills, and improving the organization of the work.

The measures prepared and put into effect by the ministries and oblast communications administrations, i.e., measures for increasing labor productivity, made it possible to reduce the requirements for auxiliary personnel by 1,500.

The USSR Communications Ministry and the trade-union committee of the republic had, by April 1960, transferred 80%, i.e., 95,000 communications workers, to the reduced workday.

Comrade Gorelov goes on to point out that the Central Committee of the Trade Union istoo slow insolving a number of problems. In 1959, the trade-union committee of the republic had already approached the Central Committee of the Trade Union and the USSR Ministry of Communications with the request that these organizations adopt a series of measures to provide for the safety of the maintenance personnel who are servicing communication lines on reinforced concrete supports; however, up to the present time these measures have not been adopted.

Since the system of allocating funds for the construction of pioneer camps and children's institutions was changed, the republic no longer sets aside capital for these major building projects. It would be useful to reinstate the former method of allocating funds, i.e., to turn this responsibility back to the ministries, departments, or trade unions.

Comrade Kon'shina, a letter carrier at the Sochi Communications Office, reported to the conference on the services performed by the Sochi mailmen for the workers of our country, as well as for foreign guests and tourists visiting this health resort. For their excellent service to workers, the delivery department of the Sochi office was awarded the title of "Collective of Communist Labor." For a number of years now, the letter carriers have been carrying out their duties in an exemplary manner, improving the quality of their work, and handling their finances successfully. They are also raising their cultural and general educational level. For example, the letter carrier Comrade Sur'ina began work after having completed only four grades; her comrades, however, assisted her in her continued studies, and last year she obtained her diploma; during 1960, she attended courses for communi-

cations department supervisors. Letter carriers Comrades Edvizhkova and V'yukova are completing their courses at the ten-year school. Moreover, these girls have mastered the telegrapher's specialty, and this they have done with the assistance and support of the collective.

Comrade Kon'shina goes on to say that she has been a letter carrier for eleven years. During this time, she has not received a single complaint with respect to her work because she is very courteous and tactful with the people with whom she deals. She passes her experience on to the newcomers. In 1959, Comrade Kon'shina took charge of a young girl, Comrade Mukhina, accompanied her frequently on her rounds, and instructed her... Now Comrade Mukhina is familiar with ten delivery postal zones, regularly exceeds the financial plan, and there are no complaints about her from the people.

Comrade Kon'shina goes on to say that the collective of the delivery department of the Sochi office decided to achieve even better results in serving the workers during the second year of the Seven-year plan.

With regard to shortcomings which interfere with proper service for the public, she noted that the communications enterprises do not have access to picture envelopes and postcards showing views of Sochi.

We receive very few artistic postage stamps, and these are in great demand. From May to October the number of vacationers in Sochi is greater than for the rest of the year, and the work load for the letter carriers increases two to three times. But the number of letter carriers remains constant, thus causing a situation in which violations of the labor laws are tolerated. The Ministry of Communications must come up with a solution to this problem. Moreover, the motor vehicles must be replaced since they are worn out.

Comrade Kon'shina reported that the letter carriers are dissatisfied with the pouches in which they carry the mail--these pouches are uncomfortable and bulky. There are not enough uniforms to go around. The letter carriers would like to have their leaves increased to 24 days.

Comrade Mukhamedeyev, the chairman of the trade-union committee of the Kazakh republic, reported that the efforts of the communications workers, social organizations, and management organizations of the currently more than 216 enterprises of the republic, now serve as examples of outstanding service to the population, and as examples for the completion of the state income plans.

As a result of the combined efforts of the

A group of delegates to the conference. From left to right: Z. G. Dzharova, a telegrapher from the Baku Telegraph Office; M. S. Basov, the chairman of the Leningrad Regional Trade-Union Committee; K. K. Shvan, the chairman of the Latvian Republic Trade-Union Committee; N. A. Yakovleva, a letter carrier from the 36th communications section of the city of Kazan; F. F. Morozov, the supervisor of the "Union Press" section of the Kara-Kalpak Communications Administration; L. A. Fedorova, a radio engineer at the Kotel'nich radio center, Kirov oblast.

trade-union and management organizations, more than 60% of the enterprises of the republic have switched to the seven-hour workday.

Comrade Mukhamedeyev goes on to say that the republic has regularly, year-in year-out, failed to achieve the goals set by the plan for equipping rural areas with radios. This was noted at the X Congress of the Communist Party of Kazakhstan. The USSR Ministry of Communications and the State Planning Committee of the Council of Ministers of the USSR (Gosplan) must therefore allocate the required amount of wire in order to complete this program. Assistance is also needed in the housing program.

Comrade Kosovskiy, a lathe operator at the UPP factory of the USSR Ministry of Communications, told of the eleven-man brigade of lathe operators which he heads and how this team attained the title of "Brigade of Communist Labor." As a result of friendly working conditions, increased specialization, and increased labor productivity, the brigade completed its assignments. The yearly plan for the production of plugs was completed 10 months ahead of schedule. The members of the brigade decided to incorporate the rationalization proposals which they themselves had put forward. At the

present time there are at the factory four brigades and 37 shock workers of communist labor.

Comrade Kosovskiy states that all of the workers at the factory are pleased with their seven-hour day, and with the fact that their pay was not reduced. We have more leisure time for social and personal affairs. The collective of our factory has taken on the responsibility of completing the production goals, given the reduced workday, of the second year of the Seven-year plan ahead of schedule.

Comrade Krasnova, chairman of the Chuvash Regional Trade-Union Committee, speaks of the need to make the postal enterprises of the republic more presentable. For this purpose, the Ministry of Communications must provide the communications enterprises with special furniture.

In the Chuvash ASSR there is a totally inadequate amount of special vehicular transportation for the delivery of the mails, there are no three-wheeled motor scooters with carrying space, and the mailtruck bodies for the GAZ-51 and GAZ-69 automobiles are not yet being mass-produced. There is much talk of bicycles for rural and departmental letter carriers; however, in Chuvash, only about 10% of the personnel are so equipped.

The RSFSR Ministry of Communications, Comrade Krasnova goes on to note, is releasing too few funds for the construction of buildings for rural communications departments. In 1959 and in 1960, a total of only 100,000 rubles were allocated for the construction of just two communications departments. How many years then must we wait for the construction of the buildings, of the 50 communications departments, which are in need of replacement.

The central office for printing and distributing postage stamps makes inadequate and irregular deliveries of artistic stamped and unstamped envelopes to the communications enterprises of the republic.

Comrade Krasnova noted that the collegium of the Ministry of Communications and the Central Committee of the Trade Union, when judging the results of the socialist competition, generally awards the prizes to the communications enterprises of large cities. The Chuvash communications workers collective, however, despite its good qualitative and quantitative indicators, is not encouraged.

Comrade Cheremushkina, the chairman of the shop committee of the Leningrad telegraph office, reported that the collective of the Leningrad telegraph office had considerably improved its operation and had, over the past

several years, completed all of the assignments which it had undertaken in the interests of socialist competition. The telegraph office was one of the first to complete the automation of its links and to convert its equipment on all main trunk lines to transmit without printed monitoring. Each year finds the collective completing its income plan and systematiaally increasing the productivity of its labor.

More than 400 persons are competing for the title of "Brigade of Communist Labor." The obsolete production norms interfere with the development of this competition. Incidentally, it should be noted that the projected new production norms do not eliminate this situation. It should be borne in mind that it is easier to work on a little-used line where less waste is tolerated, than to work on line that is more heavily worked. It is Comrade Cheremushkina's opinion that the production norms should be based on the consideration that the greater the number of telegrams handled by a telegraph office worker without loss in the quality of her work, the greater should be the pay for her work. This will make it possible to increase labor productivity and develop the competition.

The collective of the telegraph office regards it as necessary to restudy the vacation time allotted to the engineers and repairmen working in the equipment halls--these people should get 18 working days vacation, since they are often required to process telegrams, and when they have to replace equipment they must move items weighing as much as 32 kg which can be regarded as hard physical labor. It should also be taken into consideration that the maintenance and adjustment of the lines requires extreme concentration on the part of the workers.

One of the most vital problems is that of housing. 350 workers of the telegraph office are in need of housing (if we include the members of their families, this number increases to 850 people). The officers of the RSFSR and USSR Ministries of Communications have repeatedly promised to to provide the telegraph office workers with housing space. However, their promises remain unfulfilled. Nor has the presidium of the Central Committee of the Trade Union been of any help to the telegraph-office workers.

Comrade Cheremushkina goes on to say that the telegraph-office collective cannot be satisfied with the existing regulations governing the issuance of

passes to sanatoria and rest homes: for each 25 people one pass is issued for a rest home, and for each 75 people a single pass to a sanatorium. It is high time to confront the AUCCTU with the question of increasing the standards according to which these passes are issued.

Comrade Retinskiy, the chairman of the Khabarovsk Kray Trade-Union Committee, took note of the fact that the successfull completinn of the state plan for income and improvement in workmanship would be enhanced by the competition for the titles of shock-worker and collective of communist labor. At the Khabarovsk Central Telegraph Office, 530 people are participating in this competition. The title of "Collective of Communist Labor" has been awarded to the brigade of the Khabarovsk Telegraph Office (Comrade Safronov, team leader), to the brigade of the Khabarovsk Post Office (Comrade Dergunova, team leader) and to many others. Some communications workers have followed the examples set by Valentina Gaganova. The supervisors of the communications departments in the Komsomol'sk Rayon and in the Okhotsk Rayon, Comrades Abramova and Koluzaeva, respectively, transferred to the least advanced communications departments, and are striving to push them to the top.

Comrade Retinskiy states that during this period

the Central Committee of the Trade Union accomplished many things, but a large number of problems are still unsolved. For example, the standards for working hours and time-off at the communications enterprises--adopted in 1951--are now outdated, and they should be promptly reexamined and changed.

The Central Committee of the Trade Union has recently reduced its efforts in generalizing and disseminating the latest and most advanced operational information that has been accumulated throughout the communications organizations of the trade unions. The Labor Safeguard Department of the Central Committee of the Trade Union has too little control over the manner in which the ministry handles applications from the communications administrations for the release of safety equipment.

Up to the present time the RSFSR State Planning Committee has not prepared or coordinated with VTsSPS any instructions covering the supply of materials and technical equipment for the trade-union organizations, clubs, red corners, sport clubs, pioneer camps, etc., thus placing the trade-union organizations in a very difficult situation.

Comrade Vlasova, a letter carrier from the Kaluga Communications Office, spoke of the experience

of her brigade of communist labor. She reported that each member of the team (brigade) developed an increased feeling of responsibility for the work assigned to him. The letter carriers are making their deliveries, regardless of the class of mail, with out-standing care, and they are fulfilling their financial plan. They are devoting greater attention to the establishment of routes and to familiarization with postal zones, thus producing excellent results. In order to maintain the established mail delivery schedules, these letter carriers have developed a number of rules--during sorting, they must help one another so that all the members of the brigade are able to leave on their rounds at the appointed time. For the entire year these letter carriers have not received a single complaint from the population. Each member exceeds his financial plan by at least 30%.

From March of 1960 on, the workers of the Kaluga Communications Office have been operating on a seven-hour day. The new pay scales have resulted in considerable pay raises for letter carriers. Comrade Vlasova says, "I, for example, will now be getting 600 rubles--nearly twice as much as before." The communications workers are extremely grateful to the Communist Party and to the Soviet Government for the concern they show for the welfare of the soviet people.

Comrade Vlasova stated that it is important to open nurseries and kindergardens in Kaluga for the children of the communications workers. Nor has the problem of assigning school-age children to pioneer camps been settled, since the communications enterprises have no such camps of their own, and the trade unions of other organizations grant very few passes to the children of the communications workers. Comrade Vlasova goes on to say that there is also a need for the Ministry of Communications and the Central Committee of the Trade Union to take into account the fact that mailmen quickly wear out their shoes, and therefore to devise means to provide funds for the purchase of new shoes. At the present time our office only has enough funds to provide each letter carrier with a single pair of shoes for the entire year.

V. I. Prokhorov, the secretary of the VTsSPS addressed the conference and spoke of a series of problems which are before the trade-union organizations of communications and automotive and highway workers.

From the address of N. D. Psurtsev, the Minister of Communications for the USSR.

In his address to the conference, the Minister of Communications for the USSR, N. D. Psurtsev, touched upon a series of problems having to do with the development and improvement of communications facilities and with the further increase in the quality of service to the population. In recent years, soviet communications workers have been very active in carrying out the tasks assigned to them by the party and the government with respect to the development and improvement of communications facilities. However, there are a number of serious shortcomings in the work of the communications enterprises and institutions.

On the whole, over the past two years the total income of the communications organizations has risen by 1,763,000,000 rubles. But, although the plan for 1958 was exceeded by a slight margin, then the plan for 1959 only achieved 99.6% of completion. The state income plan--one of the most important indicators of the work of the communications organizations--is a necessary item so that not only the management organizations but the trade-union organizations as well devote the required

attention to this problem.

In recent years there has been a slight improvement in the quality of the work of the communications organs, and this is borne out by a number of indicators; however, this improvement is moving at an extremely slow pace. For example, a sense of values has not yet been instilled everywhere, i.e., the level of political-educational work in the communications organs is still not sufficiently high. The supervision of the activities of the enterprises is, in a number of cases, poorly set up, and the selection and assignment of cadres is still extremely defective.

Or let us take the indicator of undelivered mail. In 1958, there were 240 recorded cases of undelivered mail, last year there were 201 such cases. On the surface, this appears to be a reduction, but shouldn't the very existence of such a high number of cases of undelivered mail arouse a legitimate feeling of alarm? After all, each of these cases of undelivered mail, which only slows up the process of delivery, can be directly attributed to the laxity of undisciplined workers.

The delivery service in our operations is still

rather backward. As a result, we have many justified complaints on the part of the population, and these complaints seem to be on the rise. In 1957, 90,700 complaints of poor service were submitted, and last year there were 92,000 such complaints. It can be affirmed that the majority of these complaints were prompted by sloppy work, or by the inadequate training of individual workers to carry out their assigned tasks.

The State is releasing substantial funds to provide for the rapid delivery of mail and printed matter. It is enough to mention that during the past year 95,900 tons of airmail were carried, while this year the figure has been doubled. Until recently, whenever anyone mentioned the shortcomings of mail delivery, some managers of communications enterprises and institutions would use the excuse that the staff of letter carriers was too small, and this they attributed to the low pay. To some extent this was reflected in the work, although the root of the matter was to be found in other factors as well. Presently, following the decisions of the Party and the Government, the pay of letter carriers will be substantially increased. We have, right now, all of the necessary means to achieve substantial improvements in the work of the communications organs, and thus to raise the

level of service to the public. It is time to declare all-out war against those who do their job poorly, and who tolerate wasteful operations in their work.

The trade-union organizations are in a position to, and must, undertake a number of steps in this regard. In order to strengthen the discipline and order which is required by the state, the officers of the enterprises and trade-union organizations must rely more heavily on the communications workers themselves, and these must be given to understand the importance of their work and their responsibilities before the state and the soviet people. We should work toward a point at which the communications workers themselves will actively oppose slovenly and disruptive practices in their own work and in the operations of the entire industry.

At the same time we must disseminate and advertise the latest operational information. We must actively support the initiative of the leading workers who are competing for the titles of brigade and shock-worker of communist labor, we must create favorable conditions for the successful completion of the responsibilities which they have taken upon themselves, we must study and generalize their experience, and we must use the example

set by the leading workers to train all of the communications workers to function and live in the communist manner.

In conclusion, Comrade Psurtsev expressed his conviction that the trade-union organizations, with their extensive experience in political and organizational work among the masses, will be up to the demands made of them, and will honorably resolve all of the problems which they now face.

* *
*

The conference acknowledged the activities of the Central Committee of the Trade Union to have been satisfactory, and approved the report of the Inspection Commission. The adopted report of the chairman of the Central Committee indicated practical tasks for the further improvement of the work of the trade-union organizations.

* *
*

The greetings of foreign trade-union organizations were read to the conference. A communications and transportation exhibition, showing the latest advances, was set up for the delegates to the conference.

Communications Techniques

AUTOMATION OF RADIO TRANSMITTING EQUIPMENT

* * *

In the article " Experience in converting a short-wave transmitter for remote control" ("Herald of Communications", No. 1, 1960), certain problems in rebuilding and automating a KV-15/25 transmitter were described. Here we consider the operation of the circuits and units of this transmitter, giving certain information relating to automation of radiostations and radio centers.

The automatic optimizer described in this article was used for the first time in the technology of radio-transmitting equipment.

* * *

At operating radiostations (radio centers) it is desirable to have automatic transmitters tuned to a fixed frequency; it should be easy to shift the transmitters to any new frequency. For the units described below, conversion of existing nonautomatic units to remote control of fixed-frequency changing can be carried out by the operating staffs of the radio enterprise with the assistance of the zone laboratory. Thus it will be possible to automate many func-

tioning radiocenters in our country within the next few years.

Remoted control of an automatic transmitter, which may be done from a central desk, may include switching on, switching off, monitering, antenna selection, and frequency changing. Where the central desk and transmitters are not far apart, it is sensible to use several control circuits not requiring complex telemechanical systems.

For manually-controlled transmitters, it is necessary to rebuild the existing exciter, installing an automatic-control rack (with line relays, bridge-type coarse-tuning circuits, elements for fime tuning of the HF output stage and antenna coupling, and power-supply rectifiers); the corresponding coverage of the UBS circuit must be measured, and the on-off buttons, monitoring-element switches, and the switches for fixed-frequency and antenna selection must all be transferred to the central control desk. To do this, it is not absolutely necessary to make a new desk. The existing desk may be enlarged, as was done, for example, in rebuilding the KV-15/25 transmitters.

In addition, it is necessary to install actuating devices (motors with reduction gearing) on the selector switches for wavelength, band, and operating mode, on the

variable inductance coils (or the circuit capacitors) of all high-frequency stages, and on the antenna-coupling regulators.

In order to complete the task of automating the radiocenters rapidly, it is necessary to centralize the manufacture of the automatic control racks for a given number of fixed frequencies and actuating devices for specific transmitters.

The block diagram of a system for automatic transmitter control is shown in Fig. 1. This system permits the following operations: choice of the appropriate exciter and wideband amplifier-multiplier (ShUU); selection of a given subband; choice of the required mode of operation; rough tuning of the radio-frequency stages to the fixed wavelength; rough selection of the degree of antenna coupling; fine tuning of the output radiofrequency stage of the transmitter; transmitter loading, regulating antenna coupling.

The transmitter control system operates with eight actuating devices. The elements of the control system are mounted in a special cabinet (Fig. 2). The location of the control actuators for the radiofrequency stages is shown in Fig. 3.

By using a selector switch for the exciter and wide-

band amplifier-doubler (ShUU), the exciter is switched to the ShUU input, and the ShUU output switched to the input of the first high-frequency stage of the transmitter.

[Fig. 1. (please see next page)]

When the wavelength switch, located at the control

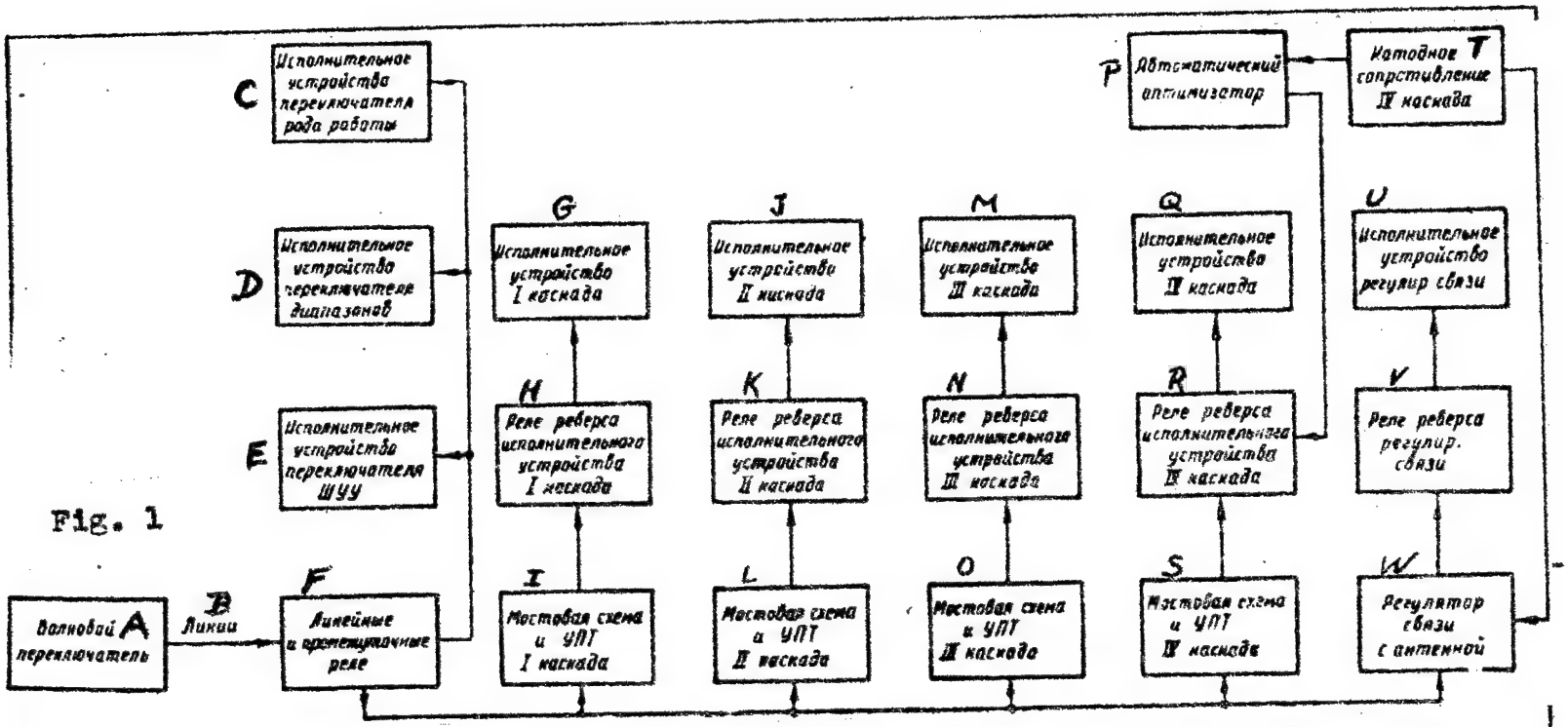


Fig. 1

KEY: A) wavelength switch; B) line; C) actuator for operating mode switch; D) bandswitch actuator; E) actuator for amplifier--doubler switch; F) line and intermediate relays; G) first-stage actuator; H) reversing relay for first-stage actuator; I) bridge circuit and DC amplifier for first stage; J) second-stage actuator; K) reversing relay for second-stage actuator; L) bridge circuit and DC amplifier for second stage; M) third-stage actuator; N) reversing relay for third-stage actuator; O) bridge circuit and DC amplifier for third stage; P) automatic optimizer; Q) fourth-stage actuator; R) reversing relay for fourth-stage actuator; S) bridge circuit and DC amplifier for fourth stage; T) fourth-stage cathode resistor; U) actuator for antenna-coupling regulator; V) reversing relay for antenna-coupling regulator; W) antenna-coupling regulator.

desk, is set to the proper position, voltage is applied to the line relay, the relay operates, and power is supplied to the switch motor, which rotates the switch (Figure 4). Two additional plates, mounted on the switch shaft, control the motor that rotates the switch and close the intermediate relay. In turn, the intermediate relay energizes the motor of the highfrequency subband switch, the motors of the operating-mode switch, the coarse-tuning system of the first, second, third, and fourth stages, and the antenna-coupling regulator.

The control actuator for the wavelength switch consists of a 1:125 reducer and a 110-v single-phase p capacitor motor, type 2ASN-400. It is possible to use RD-09 actuators, as supplied by the manufacturer.

The subband switch simultaneously switches circuit elements and the interstage couplings of all stages of the transmitter. This switch is connected through a reducer to the shaft of moter M_1; the motor control system is similar to that described above. When contacts R'_1, R'_2, R'_3, R'_4 are closed (the contacts of four type EP 41/33 relays) the switching system is thrown into the search condition. With these same relays, at the same time as the subband switch is set in the required position,

the entire coarse-tuning system of the transmitter stages is set. M_1 is a 220-v, three-phase motor, type DT-75.

The operating-mode switch carries out the basic operations by switching the power-supply circuits and UBS in the "TLG" (telegraph), "ChM" (FSK),"TLF" (telephone). The switch is thrown with a motor and reducer. The

operating-mode switch control circuit is the same as the subband switch control circuit. Here a type DT-75 three-phase motor is used. The motor is rewound to decrease the shaft speed from 2,800 rpm to 1,450 rpm; a 1:500 reduction is used.

The coarse tuning system was described in "Herald of Communications," No.. 1, 1960, pp. 6-8. Experience in the operation of the potentiometric circuit with DC bridge and DC amplifier showed that additional tuning of the intermediate high-frequency transmitter stages was not needed. Such tuning is required only in the final stage.

An accurate fine-tuning system serves to tune the final stage into precise resonance with the frequency of the drivingvoltage. Here circuit resonance corresponds to the minimum value of the DC component of the anode current (see Fig. 6). Phase-sensor circuits are used at present for automatic tuning of transmitter circuits (see "Herald of Communications," No. 6, 1957, pp. 10,11). The tun-

ing system described below, which uses an automatic optimizer, is new, being used for the first time in the technology of radio transmitting equipment.

Normal operation of a transmitter final depends upon a large number of factors, but chiefly upon the accurate tuning of the final stage. An automatic optimizer determines and maintains the minimum value of anode current for which resonance occurs. To do this, the following logical operations are carried out with aid of the optimizer:

1) The value of the input voltage U_0 (y_0 on Fig. 6) is stored;

2) the tuning control of the transmitter final is set to some value;

3) the difference $(U_0 - U_m)$ between the old, U_0, and the new, U_m, values of the input voltage is calculated;

4) this difference is integrated;

5) depending upon the value and sign of the integral of the difference, there takes place a forward or reverse rotation of the motor that tunes the final stage. stage.

Thus, the automatic optimizer realizes the principle of automatic hunting.

The optimizer consists of an amplifier-inverter, a

storage-computing device, an inertial integrating amplifier, and a device for forming a command signal. The schematic of the optimizer is given in Fig. 7, and an external view in Fig. 8.

A voltage taken from a resistor in the cathode circuit of the tube in the power stage of the transmitter, positive with respect to ground, is applied to the optimizer input. The optimizer circuit itself is so constructed that when a positive voltage is applied to the input, the optimizer seeks the maximum of the function; to do this, it carried out tuning on the basis of the input voltage minimum, and at the optimizer input there is an amplifier-inverter that uses a single triode, T_1 (a 6N3P). After the amplifier, the voltage is applied to the storage, consisting of two cathode-follower connected stages using a 6N3P (T_2), capacitor C_3, and contact 1 of R'_1.

Capacitor C_3 is connected between the output of the first amplifier and the grid of the tube of the second amplifier. Relay R'_1 operates so as to close contact $1R'_1$ for short time intervals and connect capacitor C_3 to a point of zero potential. In this period, the voltage appearing at the output of the first amplifier is "stored" in the capacitor.

When contact $1R'_1$ is opened, the voltage is applied to the grid of the second stage of the amplifier equals the difference between the voltage "stored" in capacitor C_3 and the instantaneous value of the output voltage of the first stage. From

the output of the stage, a voltage proportional to the difference is applied to the inertial integrating section (IIZ).

For the IIZ, a high-gain DC amplifier was used which employed a capacitor and resistor for heavy negative feedback. The first and second stages use a 6N2P (T_3), the output stage a 6N6P (T_4). High gain is achieved by using a tube with high transconductance in the input circuit, and high plate load resistances.

The constant of integration, which is determined by the value of one of the resistors R_{10} to R_{15} and the capacitance of C_5, may be varied. The value of the constant of integration chosen is largely determined by the required speed with which the maximum point is to be located.

The command-signal forming block (BFUS) energizes the actuating device (motor) as well as reversing it (in the event of incorrect direction of rotation of the motor). The BFUS consists of a trigger circuit for switching on the motor and reversing it.

The trigger circuit consists of the silicon diodes D_1 to D_4, type DG-Ts27, a multicontant relay, R'_1, type RKN, and a polar relay, R'_2, type RP-7 or RP-5. The winding of relay R'_1 is connected across the bridge formed by D_1, D_2, D_3, and D_4. When the voltage at the output of the integrating section (appearing across the second diagonal of the bridge) increases above zero, relay R'_1 operates, and its normally open contacts $1R'_1$, $2R'_1$, and $3R'_1$

close. When $2R_1'$ closes, the voltage at the output of the integrating section falls sharply, and the current flowing in the relay winding, which depends upon this voltage, is cut off.

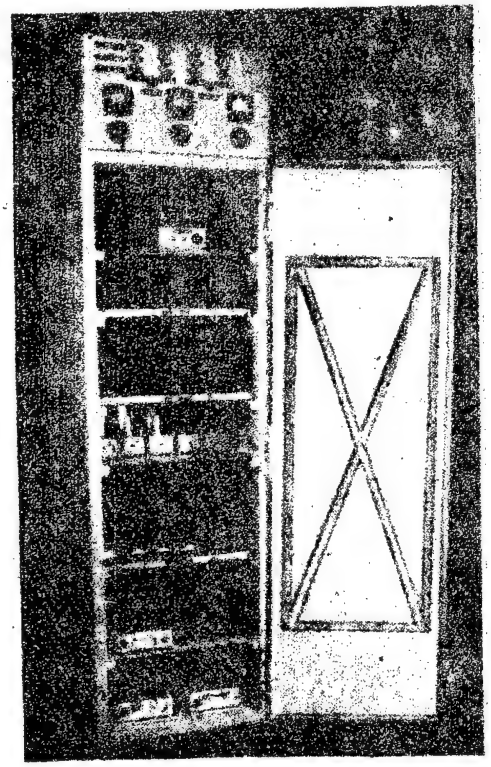


Fig. 2

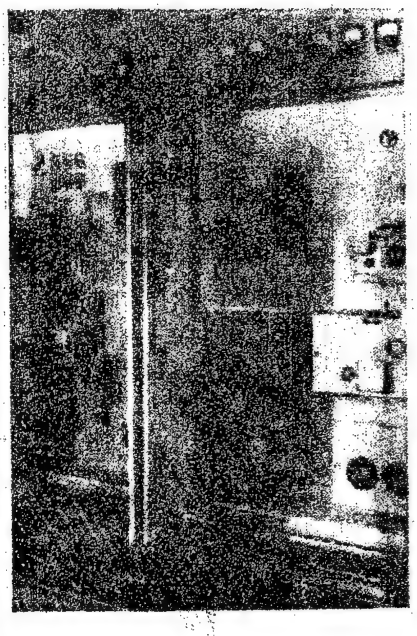


Fig. 3

Since contact $3R_1'$ is closed, the current due to the charge on capacitor C_7 flows in the same direction in the relay winding, and the armature of the relay remains pulled up as long as this current does not become less than that at which the relay opens. The time during which the relay armature is pulled up must be sufficient to allow total discharge of capacitor C_3 of the storage unit.

When contact $3R_1'$ is closed, $\neq$ 300 v is allplied to the sub-

circuit formed by resistor R_{30}, the winding of polarized relay R'_2, and capacitor C_7. When there is no current flowing in the relay winding, its middle contact closed with the left-hand contact. The winding is so connected that when current flows due to the charge on capacitor C_7, the middle contact is still strongly pulled to the left.

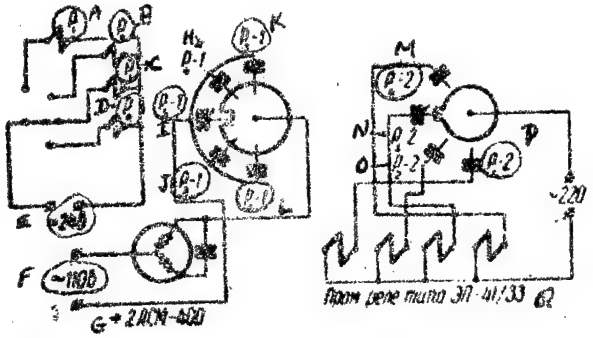


Fig. 4. A) R'_1; B) R'_2; C) R'_3 D) R'_4; E) 24 v; F) ~110 v; G) 2ASM-400; H) R'_4-1; I) R'_3-1; J) R'_2-1; K) R'_5-1; L) R'_1-1; M) R'_4-2; N) R'_3-2; O) R'_2-2; P) R'_1-2; Q) type EP-41/33 intermediate relay.

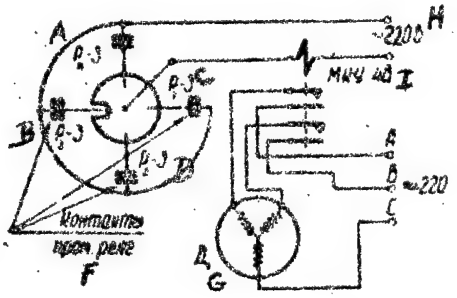


Fig. 5. A) R'_4-3; B) R'_3-3; R'_1-3; D) R'_2-3; E) ~220 v; F) contacts of intermediate relay; G) D_1; H) ~220 v; I) MKU-48.

After relay R'_1 drops out, opening contact $3R'_1$, and capacitor C_7 discharges through the winding of relay R'_2, resistor R_{28}, and the

variable resistor R_{29}. When this happens relay R_2 operates; its contacts switch on the motor. The values of resistors R_{28} and R_{29} determine the discharge time of capacitor C_7, and consequently, the time for which tje motor is energized, i.e., the "step length."

The direction of rotation of the motor is selected by the trigger circuit, which reverses the motor windings if the rotation is incorrect. The trigger circuit consists of two type MTKh-90 thyratrons, Th_1 and Th_2, and a two-coil relay R_3. The values of the resistances are chosen so that only one thyratron is arcing at any given moment.

The pulse for throwing the trigger from one condition into the other, which originates on discharge of the capacitor of the integrating section (C_5), passes through capacitors C_8 and C_9 to the igniting electrodes of the thyratrons. When the trigger is thrown, power is supplied to one of the two windings of relay R_3, whose contacts reverse the motor windings, changing its direction of rotation. When the voltage across the cathode resistor of the power stage increases, the direction of rotation of the motor changes, for any state of the trigger.

The optimizer controls the motor, applying the supply voltage for certain time intervals and, where necessary, changing the direction of rotation by reversing the windings. The duration of the time intervals (step length) for which the motor

is switched on is set when the optimizer is adjusted. The step length can be regulated with respect to the shape of the resonance curve (1 and 2 in Fig. 6).

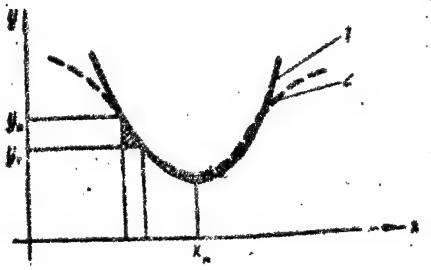


Fig. 6

The frequency at which the motor is turned on, or the duration of the interval of time for which power is not supplied to the

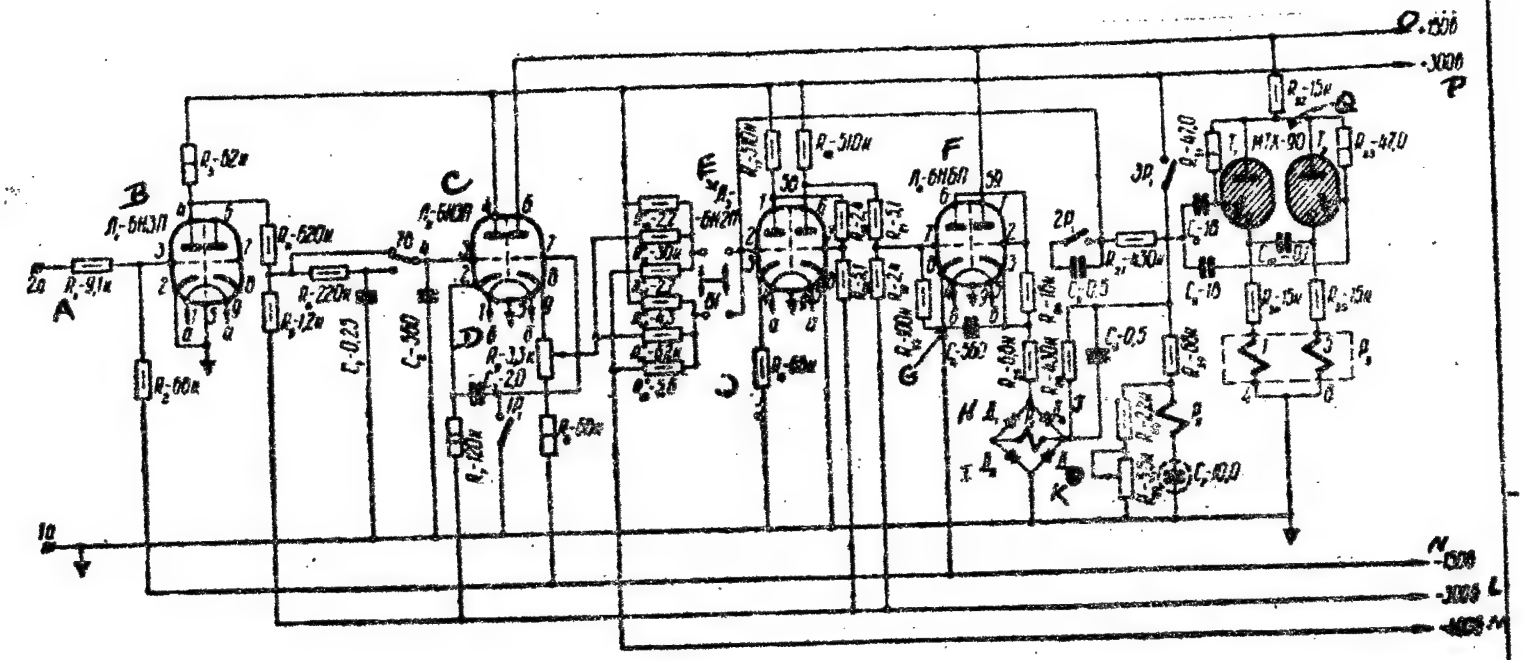


Fig. 7. A) R_1 - 9.1 kohm; B) T_1 - 6N3P; C) T_2 - 6N3P; D) b-b; E) T_3 - 6N2P; F) T_4 - 6N6P; G) c-c; H) D_1; I) D_2; J) D_4; K) D_3; L) -300 v; M) -400 v; N) -150 v; O) +150 v; P) + 300 v; Q) MTKh-90 thyratrons.

motor, is not constant, and depends upon how far off resonance the system is. The step frequency is higher the further off resonance the system is, since the motor rotates faster far from resonance, and slower when approaching it. This is done by using the integrating device in the optimizer.

Using the automatic optimizer, it is also possible to search for "maximum power" "minimum efficiency" etc., which cannot be done with other systems, such as the phase sensors. More detailed information on the operation of the automatic optimizer is given in the brochure "Scientific-technical and industrial innovations,""Automatic optimizer 1AOl-1," Subject 42, No. P59-15/1, branch of the All-union scientific and technical information institute, 1959.

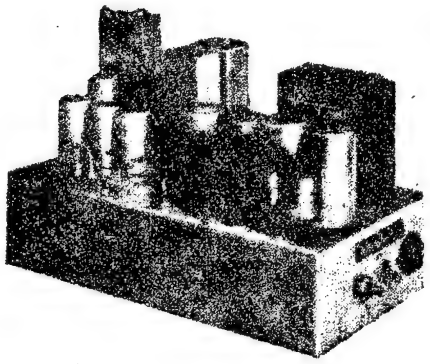


Fig. 8

Experience in the operation of the KV-15/25 transmitter has shown that when the antenna coupling is regulated automatically at the same time as an automatic system is used for locating resonance (using an optimizer), there is no mutual interference and the systems show

stable behavior.

C. E. Gorodetskiy, Engineer

TsB-I TELEPHONE EQUIPMENT FOR RURAL COMMUNICATIONS

* * *

The TsB-I-57 and TsB-I-58 telephone instruments described in the article were developed in the Scientific-research instutite for urban and rural telephone communications (NIITS) in order to improve the quality of rural communications. The equipment has an amplifier which uses semiconductor triodes. Power is supplied to the microphones in the instrument over the wires of the telephone circuit from a small central battery added at the magneto central office.

* * *

GENERAL CONSIDERATIONS

As we know, the MB (local-battery) system, still quite common in the telephone systems of VRS intrarayon (intradistrict) links, has several serious inherent defects, including, in part: 1) the necessity of installing a power source in the telephone instruments; 2) the gradual decline in the audibility of conversations owing to the decreasing voltage of such sources; 3) the need for more frequent preventive inspection of equipment than is required for a TsB (central battery) system. Initially, two dry cells are required as a power supply for the microphone of a local-

battery system telephone instrument. After a while, their internal resistance increases, and the voltage drops. For this reason, another battery must be added, and so forth. Sometimes as many as six dry cells are needed. Also, agglomeration of the carbon grains occurs in the microphone. When this happens, the set noise is very much increased, and intelligibility decreases.

The TsB-I telephone system developed in the NIITS combines the merits of both the central-battery system (in that the microphone of the instrument is supplied from a central-office battery) and the local-battery system (in that ringing and ringoff are done with a magneto-equipped instrument). The TsB-I instrument draws about 2-3 ma during a telephone conversation; thus the central battery installed at the local-battery-system office should be composed of type 3S cells, which are used for telephone-instrument power supply.

Two versions of the TsB-I instrument have been developed: 1) the TsB-I-57, which has a transmission amplifier and a type DEM-4M extra-sensitive telephone inset; and 2) the TsB-I-58, which has a transmission and receiving amplifiers, but a standard TK-47 telephone inset or a similar inset.

THE TsB-I-57 INSTRUMENT

The TsB-I-57 telephone instrument (Fig. 1) provides reliable telephone communication of a line with an effective attenuation of up to 4.5 nepers with a subscriber-circuit DC resistance of up to 4,000 ohms and a room noise at the receiver reaching 60 db. The instrument

can still operate where the subscriber-circuit resistance is increased to 10,000 ohms, and the insulation resistance is decreased to 5,000 ohms.

The following characteristics of the TsB-I-57 instrument are superior to those of telephone instruments of the local-battery system: 1) transmission power, by 0.7 neper ; 2) receiver sensitivity, by 1.5 nepers; 3) syllabic intelligibility, by 20%. The instrument has an antisidetone circuit with a two-element balancing network R_b, C_b, designed for insertion of the instrument into an electrically long steel aerial circuit have 3-mm diameter wires.

An acoustic shock absorber Fr is connected in parallel with the telephone T; it consists of two DG-Ts21 diodes. The acoustic shock absorber lowers excessively loud incoming conversations arriving from near points, and has almost no effect on long-line communication. It also protects the ear of the subscriber against acoustic shocks.

The instrument provides the option of an magnetic microphone, E. M. (DEM-4M) or a low-resistance carbon microphone, C. M. (MK-10, MK-14). The carbon microphone draws 0.3 ma, and agglomeration of the carbon powder it has been practically eliminated. The mean sensitivity of the MK-10-NO microphone at a 0.3 ma current is 1 ma/bar. The polarity of the amplifier supply does not change when the circuit conductors are interchanged; this is accomplished by using the bridge B, made of selenium disks.

The local-battery system telephone instrument of the VEF plant is used as the basic structure for assembling the TsB-I-57 instrument; the original handset is altered for the DEM-4M magnetic inset. Where a carbon microphone is used, only the telephone jack is altered in the handset. The original type C-5 transformer in the instrument is replaced with a type Sn-12 (M-42) transformer, Tr, and the three-conductor handset cord is changed to a four-conductor cord.

THE TsB-I-58 INSTRUMENT

The TsB-I-58 telephone instrument (Fig. 2) differs from the TsB-I-57 instrument only in that the former has a receiving amplifier, with a volume control, and uses the standard TK-47 telephone inset, rather than the more expensive DEM-4M inset. The receiving and transmitting amplifiers have been connected in a common-emitter circuit. Originally, temperature compensation was provided in the circuit, but this was later dispensed with, as it proved uneconomical. The MK-10-NO (or MK-14) carbon microphone is used in the TsB-I-58 instrument.

Investigation has shown that the TsB-I-58 has a considerably larger transmission factor than other types of instruments, and transmits a wider range of frequencies. Systems using TsB-I-57 and TsB-I-58 instruments have syllabic intelligibilities considerably higher than systems using other instruments; at an attenuation of 4.7 nepers, it amounts to 51%. Where the system attenuation does not exceed 4 nepers, the syllabic intelligibility reaches 55%, corresponding

to a grade of "good."

CONNECTING TsB-I EQUIPMENT TO THE LOCAL-BATTERY SYSTEM SWITCHBOARD

Connecting TsB-I equipment into a local-battery system switchboard does not require alteration of the switchboard, and can be done with the aid of an additional power-supply set (Fig. 3), consisting of the two-winding choke PK (Sh-12) and a 4 μf capacitor. Five such units are mounted on one plate 270 mm X 120 mm X 55 mm in the form of separate attachments to the switchboard.

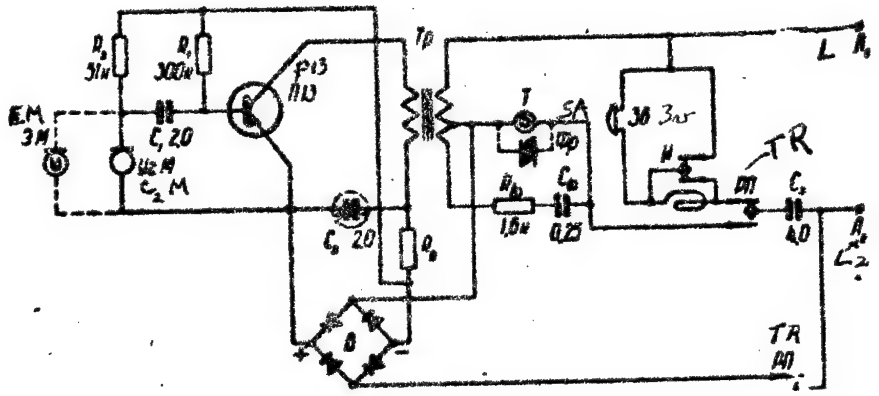


Fig. 1

Two TsB-I instruments may be connected in parallel into one subscriber circuit. Where difficulty arises in installing a local-battery system instrument in parallel with a TsB-I instrument, it is necessary to connect a blocking capacitor in series with it. Otherwise, the local-battery system instrument will continuously draw current from the office battery, and impair the TsB-I supply.

It is desirable to install TsB-I-58 instruments for the most distant

subscribers of a rural system, replacing the local-battery system instruments. Reports of good service from TsB-I-58 instruments

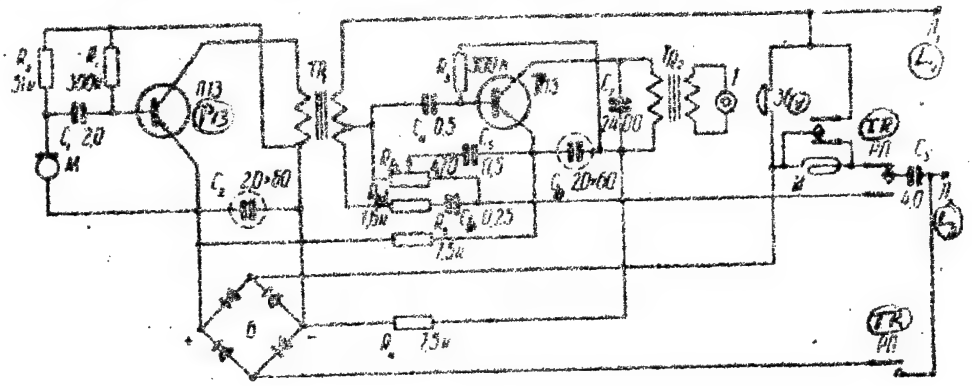


Fig. 2

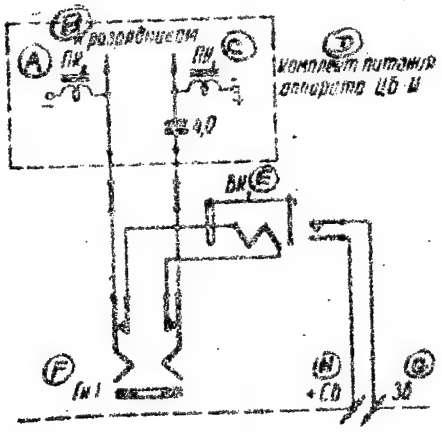


Fig. 3

A) PsS 1; B) to arrester; C) PsS 2; D) Power-supply set for TsB-I instrument; E) Sw 1; F) Jack 1; G) 3 v; H) SB

have been obtained from Tyumensk, Krasnoyarsk, Altaysk, and other oblasts of the Russian Federation.

I. Ye. Finkler, engineer, chief of the laboratory of the NIIKS

PROTECTING CABLE LINKS FROM CORROSION WHERE THEY CROSS DIRECT-CURRENT ELECTRIFIED RAILWAYS

* * *

The article analyzes the operation of an electrical-drain anti-corrosion guard. Recommendations are given for the design and use of protective devices installed where cable links cross DC electrified railways.

* * *

Last year, the institute "Giprosvyaz'" (All-union institute for the design and planning of communications facilities), together with the operating enterprises, undertook a study of the effedtiveness of electric-drain guard devices instralled at points where underground cables crossed DC electrified railways.

Fifty-six electric-drain installations were inspected, in addition toseveral places where protective devices had not been planned for and had not been installed. At these points, extended and comprehensive measurements of stray currents were made, both for sheathed cables and for the trackbeds of the electrified railways.

On the basis of the results of stray-current potential measurements, all the points inspected can be classified into four basic groups.

First group (Fig. 1). Twelve points fall into the first group. The cable sheaths at those points where the PED-45 electric drain was disconnected were positive with respect to ground and with respect to the rails. In the figure, dotted arrows show the direction of sheath current. After the electric drain was connected, the potentials at the cable sheaths at the monitoring-inspection point (KIP) 1 became negative.

the direction of the cable-sheath currents I and I_2 in this case are shown by the solid arrows, as is the direction of I_1, the current in the drain. The traction substations were located 1.3 to 1.8 km from the cable crossings.

As Fig. 1 shows, the current I_2 continues to flow along the sheath in the same direction as when the drain was disconnected, preserving the anodic zone along the cable sheath at KIPs 2 and 3. Point 3 was located 400 m from the railway; consequently, the electric drain was not effective under these conditions.

By analyzing the causes for the abnormal operation of the electric drain, it was established that the drain circuit had a high resistance in comparison with the cable-ground contact resistance. Because of this, the current I flowing in the sheath is divided, in proportion to the resistances, into the currents I_1 and I_2. When the current I_1 in the electric drain circuit was increased with the aid of a rheostat, the direction of the current I_2 ($I_1 = I + I_2$) changes, as a result of which the anodic zone at the cable sheaths at KIPs 2 and 3 completely disappeared. In this case, the absolute values of the negative potentials of the cable sheaths at KIP 1 increased. Thus, after apropriate regulation of the current

values, the electric-drain guard began to function normally and effectively.

Second group (Fig. 2). When the electric drain is disconnected, the cable sheaths are subject to changing positive potentials with respect to ground and the rails at KIPs 1 and 2. In this case, the currents in the cable sheath flowed to the rails, as shown by the dotted arrows in Fig. 2. The traction substations were located 1.6 to 4.5 km from the cable crossings.

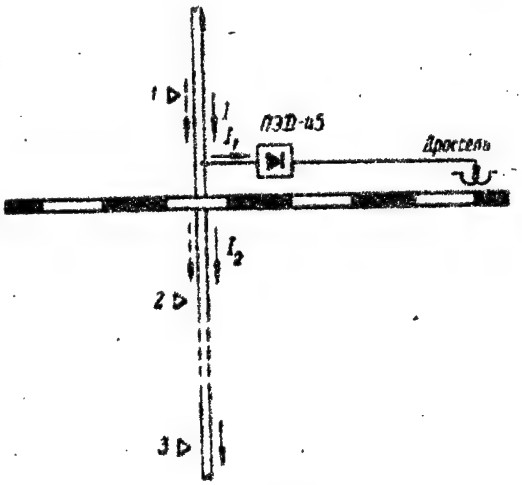


Fig. 1

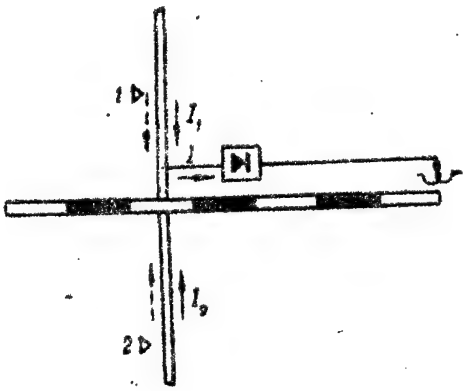


Fig. 2

When the electric drain was connnected, at KIPs 1 and 2 of the cable sheaths, rather than positive potentials, persistent negative potentials were found. The directions of the currents in the cable sheaths (at KIPs 1 and 2) and in the electric drain are indicated on the figure by the solid arrows ($I = I_1 + I_2$). The action

of the electric drain was very effective and stable in this group.

Third group (Fig. 3). Inspection measurements, carried out for several electric-drain installations disclosed that the sheaths of the cables in this case have potentials of variable sign with respectt to ground and the rails, both with the drain connected and with it disconnected. Here the direction of the current in the cable sheaths constantly varied. The nearer substation was located 8 to 12 km from the point of intersection.

The simultaneous measurement of the cable-ground and cable-track potentials, performed on the basis of the circuit given in Fig. 4, indicated that when the separate potentials of the cable sheaths with respect to ground were positive, the potentials of the cable sheaths with respect to the rails were, on the contrary, negative.

In this case, when the electric drain was connected the currents flowing from the rails along the drain to the cable flowed into the cable sheaths, on which positive potentials appeared. Examination established that the selenium disks of the PED-45 electric drain were being punctured by the back current at high rail--cable potentials. In such cases, abnormal operation was found

for several electric-drain installations of this group.

In this period, isolated positive potentials were observed on the cable sheaths with respect to the rails (the sheaths were negative with respect to ground during this time), apparently owing to higher positive potentials at distant points of the cables (in comparison with the potential on the rails at the point of measurement).

Observations of the work of the electric drains indicated that such drains were not required under the conditions considered.

Fourth group. To the fourth group belonged five places where cable links crossed electrified railways; no protective devices had been planned for these points, and none were installed. At one of these crossings, located 7.2 km from the traction substation, we found quite large potentials of varying sign, both with respect to ground and with respect to the rails. Thus corrosion guards are required at this point.

It should be noted that the results obtained in this case from the potential measurements are of interest from the standpoint of the technique of investigating and adopting the correct technical solution in designing corrosion-

guards for cables. Indeed, if we follow the changes in the values and signs of the potentials for a total time of 1 hr, 13 min, we notice a certain regularity in these changes. The variations may be divided into six independent periods, I to VI. Period I lasted 18 min., period II--25 min, III--12 min, IV--20 min, V--10 min, VI--28 min. In periods I, III, and V, the potentials are negative in sign, in period IV, positive with respect to ground and rails, while during period II and VI, their signs change, with the positive sign predominating. Thus, in the case under consideration, there takes place a consecutive and regular aternation of the polarity of the potentials on the cable sheaths. In practice, it is possible that measurements will be taken during one of the periods when there are negative potentials on the cable sheath. This will lead to an incorrect evaluation of the danger of corrosion, even though the measurements have been carried through in strict conformity with the "Guide to the protection of underground cables from corrosion," which states:"In zones where stray currents from electrified railroads are acting, readings should be taken over a 10 to 15 min interval."

At similar crossings, at KIPs 1 and 2 (Fig. 5), 10 to 15 meters from the edges of the rails, negative pot-

entials which do not change sign are observed on the cable sheaths; these are negative both with respect to ground and with respect to the rails. The mean value of the potential did not exceed 0.5 v in one hour of measurement, and the maximum potential did not exceed 0.9 v. The currents in the cable sheaths were directed to the sides opposite the rails, as shown in Fig. 5. Finally, at the two last crossings (Fig. 6), KIPs 1 and 2 of the cable sheaths are also subject to negative potentials with respect to ground and rails, and the currents flow in one direction relative to the rails. The direction of the currents in Figs. 5 and 6 show that the anodic zones at the cable sheaths are not formed near the rails, bt at some distance from them, i.e., at the points where the currents pass from the sheath to ground (KIPs 3 and 4).

It should be noted that methods are not always available for protecting cables in the cases shown in Figs. 5 and 6. Meanwhile, experience shows that cables will be damaged by corrosion at sections some distance from the tracks of electrified railways. Cables can be protected from corrosion at such points by the use of anodic electrodes or cathodic installations.

Data for the electric-drain devices studied are

as follows: maximum current drain: from 10 to 92 amp; the protected sections extend 700 to 3,600 meters; the length of the electric-drain cables is 30 to 450 meters; the resisitivity of the grounds at the protected sections is 10 to 260 ohm •meters.

Conclusions. An analysis of the operation of electric-drain devices installed at points where cable links cross electrified railways using DC current, indicates that for a correct choice of the method of protection, it is necessary first of all to perform a large number of careful and extended measurements of the potentials of the stray currents, both at cable sheaths and at the rails.

For electric-drain protection to be effective, it is necessary to improve the quality of the investigations made while designing cablexguards, and to improve the methods by which protective devices are utilized; to do this, in addition to the points set forth in the "Guide to the protection of underground cables from corrosion," the following should be taken into consideration:

1. When conducting investigations for the purpose of determining the degree of corrosion of cable sheaths by stray currents, it is necessary to measure simultaneously the potentials to ground and to the rails on the cable sheaths at KIPs located near the rails on both sides of the point of intersection of the cables with the railway.

It is recommended that the potentials at the cable sheaths be measured by two meters at once; the meters should be connected according to the circuit given in Fig. 4. These

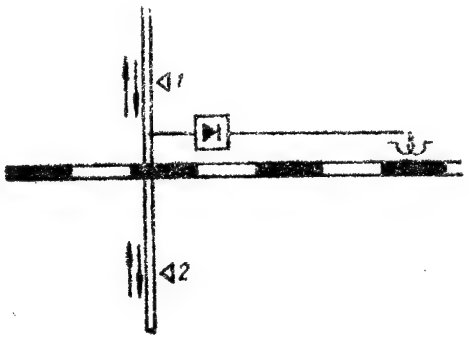


Fig. 3

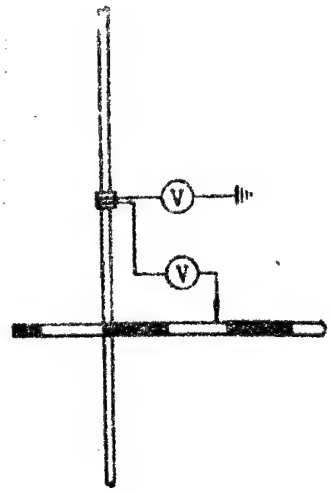


Fig. 4

measurements should be carried out at each KIP at 15 to 30 sec intervals, for a length of time sufficient for an electric train to pass between two neighboring traction substations in both directions.

If two instruments are not at hand, the cable--ground and cable--rails potential measurements can be carried out accurately enough with one meter by using a special push-button switch (Fig. 7). In order to decrease the interval between potential measurements, readings and recording of the voltmeter indications carried out by taking cable--

ground and cable--rails readings in turn.

2. The direction of the currents in the cable sheaths must be determined simultaneously at two KIPs 1 and 2, located on both sides on the railroad, according to the circuit given in Fig. 8.

3. If on the basis of the measurements it is decided to design an electric-drain guard for the given crossing, then it should be kept in mind that the electric drain cable must be connected to that point on the protected cable where there is the largest value of mean positive potential with respect to ground and the rails. The electric drain should be connected at a point between two KIPs (Fig. 1).

4 The effectiveness of an electric-drain installation is checked by measuring both the current in the electric-drain circuit and the potentials with respect to ground on the the cable sheath. To do this, it is necessary to pay special attention to the value of the protective current passing through the electric drain from the cable into the rails (by the protective current, we mean the minimum current for which a negative potential not changing in sign is created at the

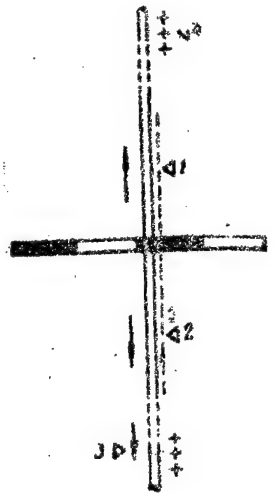


Fig. 5

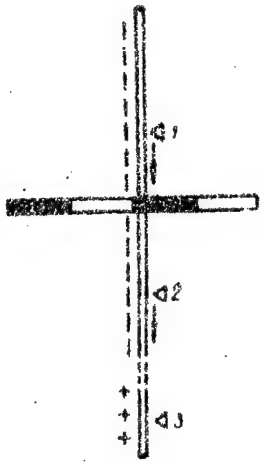


Fig. 6

Push-button switch

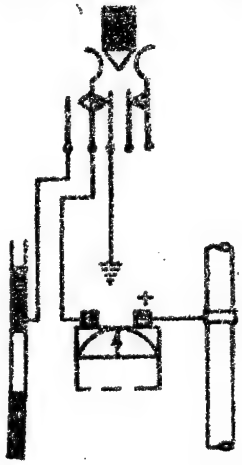


Fig. 7

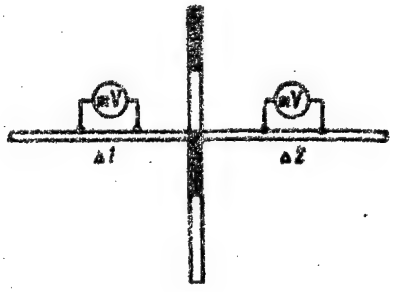


Fig. 8

cable sheath, while the currents at KIPs 1 and 2 are directed toward the eledtric drain).

If the operating regime described above is maintained by the electric drain for the length of time required to run an electric train back and forth between two traction substations, it shows that the electric drain installation has been correctly designed, and it may be placed in operation.

At cable--railway crossings where there are negative potentials of unvarying sign at the cable sheaths, the currents flowing along the cable will be directed away from the rails. In the majority of cases, these currents will cause anodic (danger) zones at the cable sheaths a certain distance from the rails.

The anodic zones are found by measuring the potentials at the KIPs, while between them the potentials are measured by using a remote nonpolarizing electrode. The anode zones thus found can be eliminated by means of anodic electrodes or cathodic stations, where there is a source of DC near the cable; the desirability of cathodic protection is supported by economic considerations.

5. Experience in the use of the type PED-45 electric drain has established that the selenium stack

used in the device frequently is out of order, due to puncturing of the disks by the back current at high rail -- cable potentials. Therefore, at points of the electric-drain guard where reverse-sign rail--cable potentials exceed 8 v, it is recommended that the PED-45 selenium stack be replaced with ten type DG-Ts22 or DG-Ts24 rectifiers.

V. N. Akulenok, engineer, leader of the protection group of the "Giprosvyaz'" institute.

AN INSTRUMENT FOR MEASURING THE INPUT IMPEDANCE OF LOW- AND MEDIUM-FREQUENCY BROADCAST ANTENNAS

* * *

The article describes the circuit and construction of an instrument with which it is possible to measure input impedances from 10 to 1,000 ohms for the resistive and reactive elements of antenna-feeder set-ups over the 200 to 2,000 meter range. The method of measurement is briefly set forth.

In addition to input impedance, the instrument makes it possible to to measure the impedances of coils, capacitors, and pure resistances over the frequency band mentioned.

* * *

At the present time, equipment for measuring the input impedance of antenna-feeder systems is still not being made on a production basis. Therefore, the instrument described below is of practical interest.

Under actual conditions, an antenna, unlike, for example, a capacitor or a coil, is, as we know, a two-terminal network, i. e., it has internal sources of emf differing widely in frequency and level. They are created in the antenna by varibus radio-station signals and interferences. This circumstance considerably complicates not only the measuring process, but the construction of the instrument itself, since it must be very much unaffected by noise, both to achieve the required degree of accuracy, and to protect the instrument from damage. The utilization of special selective meters, of heterodyning, and other similar measures would lead to several unsatisfactory circuit and structural complications. Thus it seemed very reasonable simply to raise the level of the signal of the test oscillator by several orders, bringing it up to several tens of volts; this was done in the device being considered.

Several considerations dictated designing the measuring circuit on the basis of the resonance substitution method. This method permits the determination .

of both components of the input impedance. The basic technical characteristics of the device are as follows:

1. Frequency range, 200 to 2,000 meters.

2. Measurement range: resistance, 10 to 1,000 ohms; reactance, ± (10 to 1,000) ohms with an error of ±5% (±10% at the ends of the reactance range).

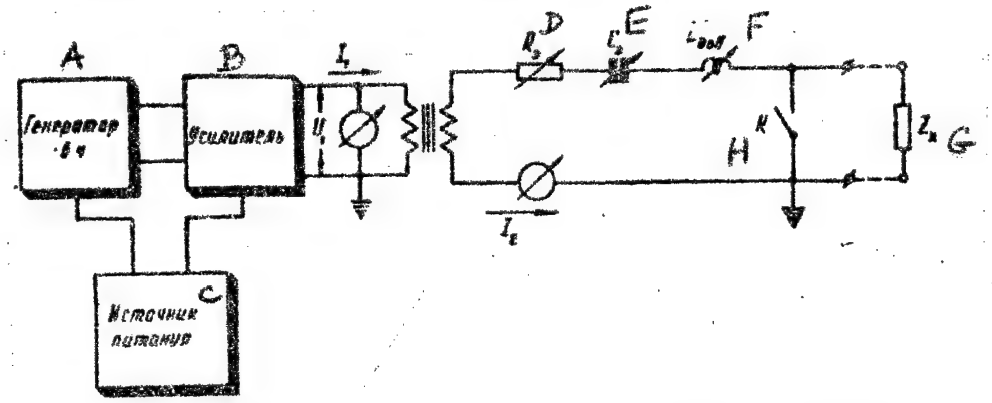


Fig. 1. A) High-frequency oscillator; B) amplifier; C) Power supply; D) R_s; E) C_s; F) L_a; G) Z_x; H) S.

3. The output of the instrument is single-ended, with one grounded terminal.

4. The instrument operates from the AC mains.

5. It weighs less than 20 kg.

The instrument has the following basic sections (Fig. 1): oscillator, power amplifier, measuring circuits, and two meters. Connecting the impedance Z_x into the measuring circuit, we tune the circuit into resonance, using $X_s(C_s)$ (for the maximum of current I_2); to do this, we substitute the standard elements X'_s, R'_s, and the

current I_2'. After this, the switch S is closed (short-circuiting the impedance Z_x), the circuit is again tuned to resonance, and, using the standard resistance R_s, the previous value of the current is sought, i. e., $I_2'' \approx I_2'$. To do this, the corresponding values of the standard elements R_s'' and X_s'' are substituted. The desired values of the components of the impedance being measured are determined on the basis of the formulas:

$$R_x = \Delta R_s = R_s'' - R_s', \quad (1)$$

$$X_x = \Delta X_s = X_s' - X_s''. \quad (2)$$

During the measurement, it is necessary to monitor the constancy of the EMF E_2 (i. e. to see that the current I_1 or the voltage U_1 is constant).

The basic circuit of the instrument is shown in Fig. 2. The low-power self-excited oscillator with inductive feedback uses a 6K3 tube (// the equivalent of a 6SK7). The oscillator coils are mounted on closed carbonyl cores, type SB-3. The frequency of the oscillator is set using a continuously variable capacitor. The entire range is covered in three bands, chosen by switch S_1.

The power amplifier uses a 6N5S tube with its triodes connected in parallel; it operates class A in an aperiodic cathode-follower circuit. In this case,

40 to 50 v can be obtained at the amplifier output without significant distortion of the signal; the power delivered to the measuring circuit is 2 to 2.5 watts where the resistive component of the impedance being measured is 360 ohms or less.

The measuring circuit is connected to the power amplifier by means of a high-frequency transformer with a closed core. This transformer has a tapped secondary. The transformer tap chosen depends upon the order of magnitude of the impedance being measured.

The basic error in measurements using the resonance substitution method depends upon the effect of the stray capacitances of the measuring circuit. Thus, careful design of the instrument is important: the construction and location of the measuring-circuit elements, their mounting, the method of switching, etc., must all be considered in order to ensure the minimum stray admittance in the measuring circuit. In order to reduce the stray capacitances of the windings of the high-frequency transformer, "oxifer M-2000" was used as the core material.

The desired voltage level at the transformer primary was obtained by using a potentiometer connected in the screen circuit of the oscillator tube. The value of the voltage was monitored a level indicator consisting of a voltmeter using the DG-Ts6 crystal diode. The meter itself was a permanent-magnet--moving coil instrument with a 100 μa scale.

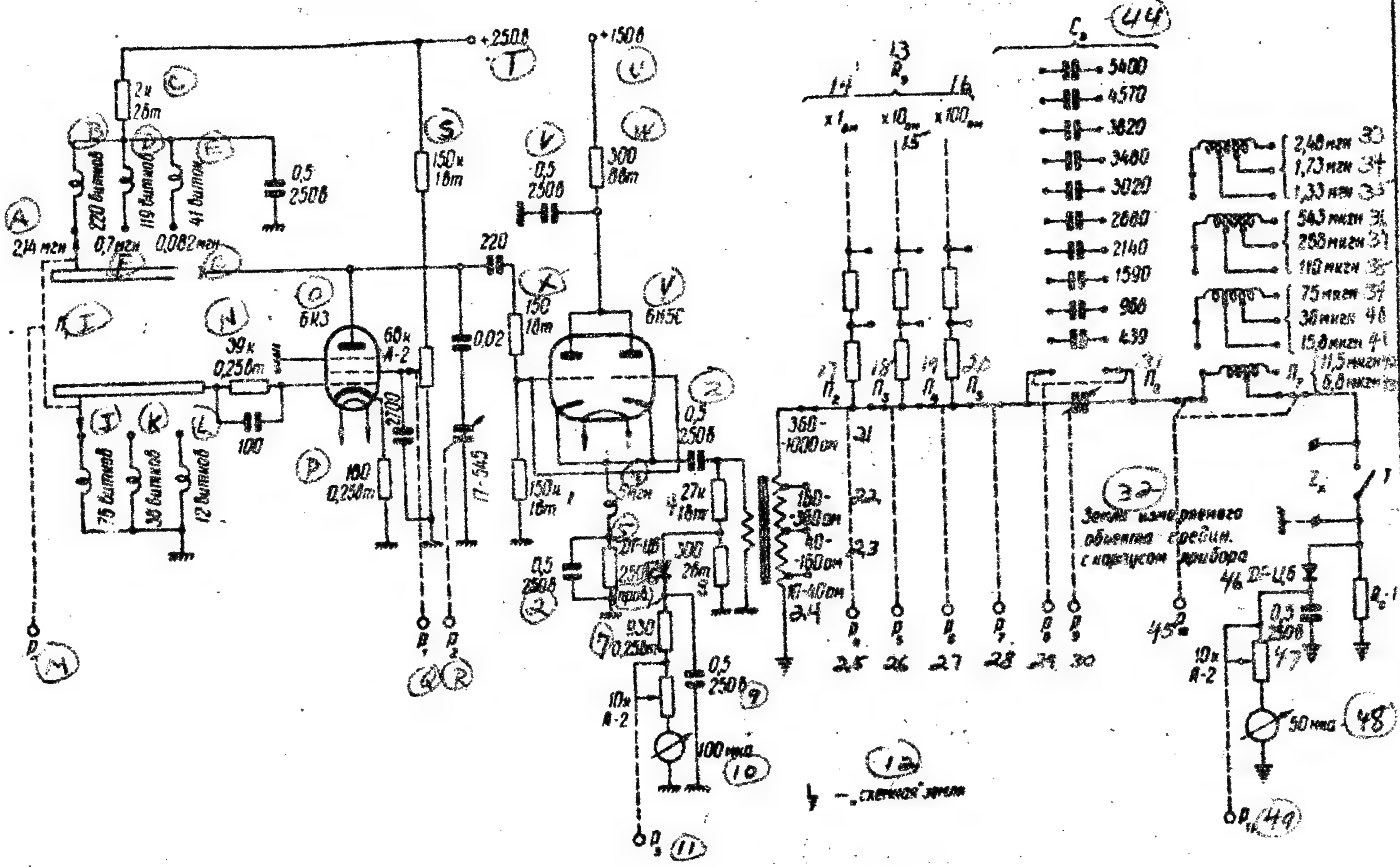


Fig. 2. (See KEY next page please)

FIG. 2.

KEY

Fig. 2. A) 2.14 mh; B)220 turns; C) 2 k, 2 watts; D) 119 turns; E) 41 turns; 0.7 mh; G) 0.082 mh; H) 250 v; I) Sw_1; J) 36 turns; K) 38 turns; L) 12 turns; M) Ctl_0; N) 39 k, 0.25 watt; O) 6K3; P) 180, 0.25 watt; Q) Ctl_1; R) Ctl_2; S) 50 k, 1 watt; T) +250 v; U) +150 v; V) 0.5, 250 v; W)300, 8 watts; X) 150, 1 watt; Y) 6N5S; Z) 0.5, 250 v; 1) 150 k, 1 watt; 2) 0.5 250 v; 3) 5 ma; 4) 27 k, 1 watt; 5) DF-Ts6; 6) probe; 7) 930, 0.25 watt; 8) 300, 2 watts; 9) 0.5, 250 v; 10) 100 μa; 11) Ctl_3; (con't)

12) measuring circuit ground; 13) R_s; 14) X 1 ohm; X 10 ohms; 16) X 100 ohms;
17) Sw_2; 18) Sw_3; 19) Sw_4; 20) Sw_5; 21) 360-1,000 ohms;
22) 160-360 ohms; 23) 40-160 ohms; 24) 10-40 ohms; 25) Ctl_4;
26) Ctl_5; 27) Ctl_6; 28) Ctl_7; 29) Ctl_8; 30) Ctl_9; 31) Sw_6;
32) the ground of the object of measurement is connected to the instrument chassis; 33) 2.48 mh; 34) 1.73 mh;
35) 1.33 mh; 36) 543 μh; 37) 288 μh; 38) 110 μh;
39) 75 μh; 40) 36 μh; 41) 15.3 μh; 42) 11.5 μh;
43) 6.8 μh; 44) C_s; 45) Ctl_{10}; 46) DG-Ts6; 47) 0.5, 250 v;
48) 50 μa; 49) Ctl_{11}.

The measuring circuit of the instrument is composed of a standard-resistance box, a variable standard capacitor, a standard-capacitance box, and a set of inductances. The arrangement of measuring-circuit elements shown in the circuit diagram provides the minimum measurement error for the given designs of the switches and other measuring-circuit elements which determine the stray capacitances.

A single-pole switching circuit is used to connect in the standard resistors. This permits the use of one-half the number of make-before-break contacts that the standard resistance switch would require with double-pole switching, and considerably eases the taskk of matching the standard resistances, since in this case only three decade ratings are needed (1, 10, and 100 ohms)

The "one-ohm" decade takes the form of a short wire-wound resistor rigidly mounted as linear segments directly on switch Sw_3. The wire-wound resistances of the "ten-ohm" decade are mounted on switch Sw_4; they are wound as "criss-cross threads" (Fig. 3), since such a winding produces a noninductive resistance and sharply decreases the stray capacitance. The "hundred-ohm" decade is made up of carbon resistors mounted on switch Sw_5.

The capacitance box of the measuring circuit uses double-pole switching (switch Sw_5), since to use single-pole switching here would require the use of a special nonstandard switch. The variable standard capacitor is a two-gang capacitor with its sections connected in parallel; the total capacitance is 36 to 1,080 micromicrofarads. The standard capacitance box is made up of type KSO capacitors whose rated values differ by approximately 500 micromicrofarads. Thus the interval between the values of the fixed capacitors is more than covered by the variable standard capacitor.

The measuring-circuit inductances are mounted on switch Sw_7; they take the form of four tapped coils wound on closed toriodal "oxifer M400" cores.

The measuring-circuit current is monitored by using a tuning indicator, a voltmeter with a DG-Ts6 crystal diode. The voltage across a type ULI 11-ohm resistor is applied to the tuning indicator. The "ground" lead of the measuring circuit is insulated from the instrument chassis,

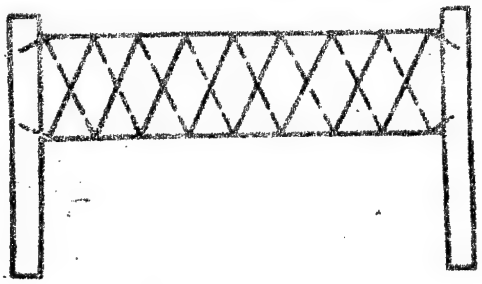


Fig. 3

which makes it possible to connect the resistor, as shown in Fig. 2. Connecting the resistance in this way makes it possible to avoid having a voltage appear across it when the measuring-circuit toggle switch is open, due to stray (capacitive) currents. This eliminates one of the basic factors causing measurement errors. The tuning-indication meter uses a permanent-magnet moving-coil system with a 50-microamp scale.

The sensitivities of both the tuning indicator and the level indicator can be controlled within wide limits by varying the resistor connected in series with the meters.

The basic circuit of the instrument's rectifier

is shown in Fig. 4. The line filter serves to eliminate interference appearing through the mains caused by the strong high-frequency fields at the radio center. An exterior view of the instrument is given in Fig. 5.

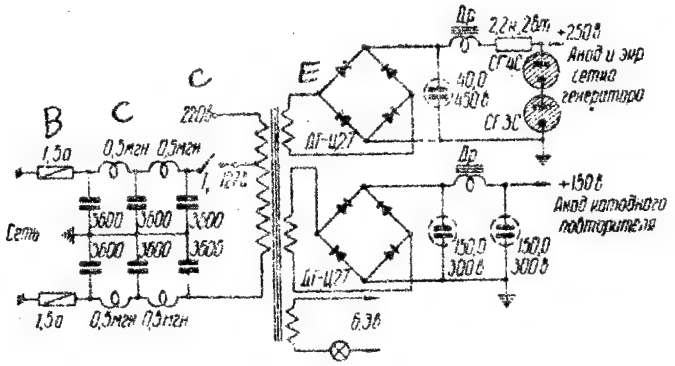


Fig. 4. A) Line; B) 1.5 amp; C) 0.5 mh; D) 127 v; E) DG-Ts27; F) 6.3 v; G) choke; H) 450 v; I) ST3S; J) 300 v; K) 2.2 k, 2 watts; L) +250 v; M) oscillator plate and screen; N) +150 v; O) plate of cathode follower.

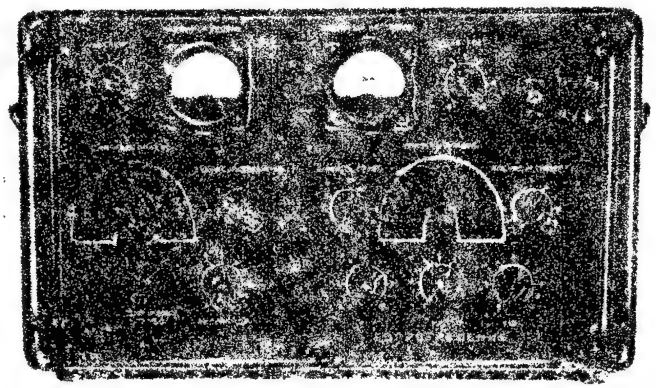


Fig. 5

It should be noted that all of the parts and materials used in the instrument are standard, and produced commercially.

Let us consider the measuring process and give certain practical recommendations. The impedance to be measured, Z_x, is connected to the terminals of the instrument, with the grounded side connected to the lower terminal. The required oscillator frequency is set by using the subband switch (control Ctl_0 - see Fig. 2) and the variable capacitor (Ctl_2).

The voltage level at the primary of the transformer is set with control Ctl_1, and checked by means of the level indicator, whose sensitivity is regulated with control Ctl_3. In doing this, to avoid overloading the power amplifier, the level should not exceed 50 v.

The measuring circuit is initially tuned to resonance with the measured impedance connected (i. e., with the toggle switch T open) and the standard resistances in the zero positions. The variable capacitor (control Ctl_9), the capacitance-box switch (control Ctl_8), and the added-inductance switch (control Ctl_{10}) are used in tuning, using the maximum reading of the tuning indicator.

To increase the accuracy of the measurements, we recommend that large value of the capacitances be used in tuning (i. e., low characteristic impedance of the measuring circuit); the value should be such, however, that a sufficiently sharp resonance is still obtained.

When measuring pure reactances, in order to avoid large overvoltages in the measuring circuit owing to the use of the high-resistance sections of the transformer, a pure resistance must be introduced into the measuring circuit in tuning, i. e., zero values of the decade box should not be used. The value of the pure resistance introduced depends upon the sections of the transformer which are used (Fig. 2).

After the circuit is tuned to resonance, the value of the standard capacitance C_s' and the reading I_2' of the tuning indicator are recorded. After this, a pure resistance is introduced which is of the same order as the resistive component of the impedance being measured. If the order of this value is not known, it will first be necessary to introduce a resistance of several hundred ohms. This value of R_s' is also recorded. After this, the toggle switch of the measuring circuit is thrown to the closed position; now it is again necessary to tune the circuit to resonance on the

basis of the maximum reading of the tuning indicator. In doing this, it is not permissible to change the settings of the transformer-section and added-inductance switches.

The new position of the standard capacitance C_S'' is recorded. In tuning, it is necessary to obtain the tuning-indicator reading recorded in the first tuning operation (where Z_X was shorted out), $I_2'' = I_2'$, by adjusting the resistance box; the new value of R_S'' is recorded. Following this, the magnitude of the resistive component of the impedance being measured is calculated, on the basis of the change in the settings of the resistance decade box controls for the two measurements discussed, using formula (1).

The value of the reactive components is determined by calculation on the basis of the known frequency and the values of the tuned capacitances for the first and second measurements, using expression (2).

If the reactive component of the measured impedance is inductive in nature ($X_X > 0$), then when the impedance Z_X is short-circuited, a larger capacitance is required for tuning than when the impedance is not short-circuited. On the other hand, where the measured impedance has a capacitive character, $X_X < 0$, and Z_X is short-circuited, less capacitance is required.

During the measurement process, the level of the voltage across the transformer primary drops considerably. Nevertheless, after the tuning circuit has been brought into resonance, it is necessary to check this voltage on the level indicator, and, where needed, set control Ctl_1 to its setting at the end of the first measurement (where Z_x was not shorted out).

As shown by laboratory tests and measurements of actual broadcasting antenna, the instrument described satisfies the technical conditions formulated above. With it, in many cases, especially where the resistive components are being measured, the accuracy of the measurements can be better than the values of these technical requirements. The considerations as to simplicity of operation and operational reliability under the conditions of radiostation service were also confirmed.

--V. A. Khatskelevich, candidate in technical sciences, Docent, LEIS [abbreviation not available in the standard sources], L. N. Yakovlev, engineer.

TWENTY-NUMBER TEST INSTRUMENT FOR ALL-RELAY EXCHANGES OF INTRARAYON SYSTEMS (ATS VRS)

Recently, low-capacity type VRS all-relay exchanges have become common at telephone centers of intra-

rayon communications systems. For normal operation of these exchanges, it is necessary to provide rapid means of testing the continuity of the associated subscriber and switching circuits, as well as of office equipment involved in making connections. For this purpose, there is a test jack mounted on the entrance test-board furnished with the station-equipment set for 20-number intra-rayon system (VRS) all-relay exchanges; however, the corresponding test instrument for these stations is not yet available from industry.

For a test instrument for VRS all-relay exchanges, the existing test instrument for central-battery systems can be used, if some small changes are made in the mounting arrangement, and the following parts are added: a 20-spring three-position key, a dial, two 330-ohm chokes, two 880-ohm chokes, and four 0.5- to 1-microfarad capacitors.

The 20-spring key, SK, labeled "Serv." and "Subs.", is mounted on the front side of the measuring instrument, next to the "Subs." - "Office" key. The dial is installed in the lower part of the instrument, and the remaining parts are placed inside, while the DC bell is mounted outside and above the instrument (Fig. 1).

The basic circuit for connecting the additional

parts is shown in Figure 2.

The central-battery test instrument is designed for 24-v operation, while the VRS all-relay exchanges use a 60-v power supply. Thus, in order to maintain the rated currents in the milliammeter circuits, the resistances in series with the signalling and microphone circuits in the test-instrument circuit must be increased by 2.5 times.

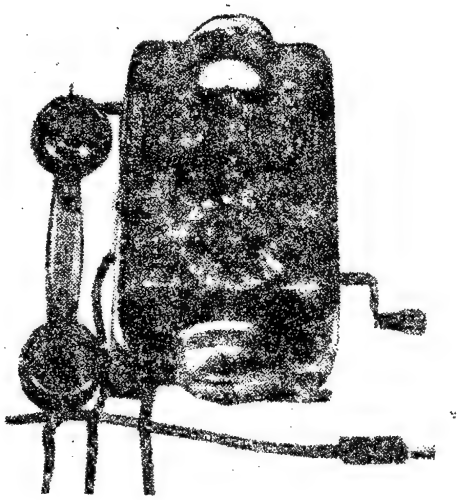


Fig. 1

Thus 1,000-ohm resistors must be substituted for the 400 ohm resistors in the signalling and milliammeter circuits, and a 1,250-ohm resistor for the 500-ohm resistor in the microphone circuit. The calling lamp, designed for 24 v, is replaced with a 60 v bulb.

With these adaptations, the test instrument can be used for: 1) checking a subscriber circuit; 2)

checking a subscriber set; 3) checking the connector-relay and other VRS all-relay exchange sets (for battery signalling); 4) testing station ends of trunks in manual exchanges (for battery and magneto signalling). Each of these tests are carried out after the test-instrument cord is plugged into the test jack of the circuit under test.

To check a subscriber circuit the "Subs." - "Office" test-instrument key is placed in the "Subs." position. The additional key SK is set to the middle position. A ringing signal is sent toward the subscriber, using the magneto included in the test instrument. If the bell rings while the ringing signal is being sent, this indicates that the tested circuit has no breaks.

During a conversation with a called subscriber, the subscriber's microphone and the test instrument microphone are powered by the instrument's battery.

To check a subscriber set, the "Subs." - "Office"switch is set to the "Office" position, while the switch SK is set to the "Subs." position. If a dial tone is obtained, it indicates continuity of the subscriber and cord set; then the number of one of the exchange subscribers is selected. The proper exchange relay should vibrate

in unison with the circuit interruptions by the dial pulse contacts PC. The test instrument circuit is shorted by the shunt contact ShC of the dial.

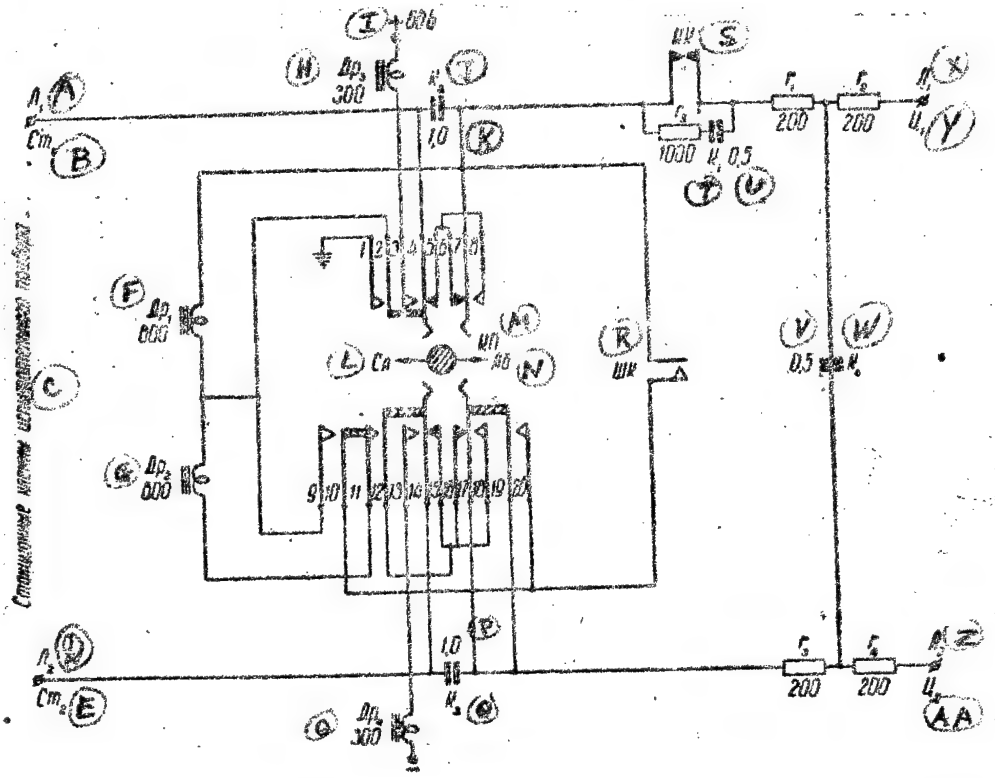


Fig. 2. A) l_1; B) Off_1; C) Office terminals of test instrument; D) l_2; E) Off_2; F) Choke 1, 800; G) choke 2, 800; H) choke 3, 300; I) +60 v; J) C_2; K) 1.0; L) Ser.; M) SK; N) Subs.; O) choke 4, 300; P) 1.0; Q) C_3; R) ShC; S) PC; T) C_1; U) 0.5; V) 0.5; W) C_4; X) l_1; Y) Ci_1; Z) l_2; AA) Ci_2.

During conversation with the called subscriber, both microphones are supplied from the VRS relay-exchange battery.

To check the trunk to another VRS all-relay exchange, the test instrument "Subs"-- "Office"

key is set to the "Office" position, and the SK key set to the "Tr" position. The check is carried out in the sequence described above, and the instrument microphone is supplied from the instrument battery.

Finally, to test the manual-exchange side of a trunk, the "Subs." - "Office" key is set in the "Subs."position, and the key SK in the middle position.

In this case, signalling to the manual-exchange switchboard is done with the magneto in the test instrument. The instrument microphone is supplied from the instrument battery, and the operator's microphone from the battery at the manual telephone exchange.

Using the milliammeter installed in the test instrument, it is possible to check the continuity of subscriber or trunk circuits, the condition of the insulation of these lines, and also the existence of conductor-to-conductor or conductor-to-ground shorts.

--B. G. Nalbandian, director of the Tambovsk oblast communications administration.

COMMUNICATIONS ECONOMICS

ELIMINATING THE SHORTCOMINGS IN THE INDEPENDENT (NON-STATE) FINANCING SYSTEM(*)

The tremendous tasks in the building of communism, tasks that were set by the XXI Congress of the CPSU, demand continued advances in the level of economic and organizational activities throughout all of the segments of our economy. The expansion and strengthening of the system of independent financing at the enterprises will play a considerable role in the completion of the tasks now before our communications workers.

Experience has shown that as an enterprise begins to handle its own financial affairs (financing from within), as a rule, its economic operations begin to improve, labor productivity experiences an uninterrupted upward climb, the cost of production is reduced, and the quality of the service offered to the public is improved. This also applies to the Odessa Telegraph and Telephone Office, which went over to independent financing in 1955. All of the

(*) Translator's Note: "Khozraschet."

operational indicators for this enterprise were improved.

Thus last year, as opposed to 1956, the volume of production in ruble amounts increased by 19.3%, income through charges (tariffs) increased by 8.9%, the actual income of the enterprise increased by 18.1%, the output per individual worker increased by 19.2%, and the cost of the services was reduced by 18%. The relative number of improperly transmitted telegrams was reduced from 0.34% to 0.11%; the relative number of incompleted telephone calls was reduced from 0.9 to 0.47%; the relative number of delayed telegrams--from 1.9 to 0.34%; the number of conversations involving a one-or-more hour delay before connection--from 5.2 to 1%. The number of complaints with respect to the operation of the telegraph office dropped from 67 to 27, and the number of complaints about the work of the Interurban Telephone Office dropped from 46 to 11.

These results did not appear out of the thin air. They are the result of carrying out a number of organizational and technical measures. Of these, the most effective include: the introduction of reperforator retransmission of telegrams by means of mechanical tape transport; the installation of a concentrator = S on a little-used link = S; the modernization of equipment; the combining of the reception and transmission operation on a single tel-

egraph apparatus, without printed monitoring of the transmission; the reorganization of the management of the enterprise; and the reduction of the number of jobs, etc. These measures enhanced the rise in labor productivity at our office, and facilitated and improved the working conditions, and also provide the economy with the funds for capital and operational expenditures.

The introduction of the khozraschet in our office played a considerable role in putting all of these measures into effect. With this system of independent financing it became possible to use funds of the enterprise and its operational organizations, i.e., funds which had not been anticipated in the financial estimates; moreover, the workers themselves developed an interest in the fullest realization of the potentials which these funds provided. However, these achievements have by no means brought us to the limit of our potentials. The operations of the enterprise can be even further improved, but for this purpose a number of shortcomings must be eliminated from the existing system of independent financing at the communications enterprises; shortcomings which have reduced the possibility of using the system of independent financing to a point where

it is considerably behind its application at industrial enterprises.

While industry can stimulate the fulfilling and overfulfilling of the revenue plans by setting aside proportional amounts into reserves for the enterprises, the communications enterprises do not necessarily follow this principle of proportionality for the formation of their reserve funds. This is confirmed by the following data. For the period 1956-1959, the income and withdrawal (reserve formation for enterprise) figures came to: 1956, income, 1,133.4 thousand rubles; 1957, 1,903.8 thousand rubles; 1958, 2,006.8 thousand rubles; 1959, 2,500 thousand rubles; the amounts withdrawn for reserves came to, respectively: 118.3; 140.5; 24; and 93 thousand rubles. Thus, even with consistent increases in income, the communications enterprises reserve funds can decline, as was the case with the Odessa Telegraph and Telephone Office of Communications in 1958. It is clear that a lack of proportionality between the income and the amounts taken for the funds of the enterprise will reduce the interest of the collectives in carrying out the income plan.

Unlike industry, where unit wholesale prices are based on average production costs, communications enterprises must rely on planned estimated prices

(which enter into the bulk-rate prices), and these are determined on the basis of actual costs for individual output, i.e., the production costs at the particular enterprise. This method of forming income at the enterprise cannot serve as a stimulus in the struggle to increase the economic viability of the enterprise.

A communications enterprise operating under the khozraschet system will be an economically sound venture even if the production costs exceed the average production costs by a considerable margin, while an industrial enterprise, given a similar set of circumstances, will prove to be an unprofitable undertaking.

An industrial enterprise, in the event that the production volume exceeds the plan, may increase the total payroll expenditures--a step which speeds the introduction of the independent financing system in the shops of the enterprise. Communications enterprises, however, have no right to exceed the planned estimates, even if the plan is overfulfilled. Thus the possibility of introducing the independent financing system to the shops is restricted.

Among the shortcomings of the existing system of independent financing we find also the absence of coordination between tariffs and actual enterprise income, etc.

It seems to us that some of these shortcomings could be eliminated right now if we would institute a system in which the planned price is based on the average cost of production; this step would create the interest on the the part of the communications enterprises to achieve a position of economic viability. We could make use of the available estimates for the production costs of units that have just been produced, and if the planned price were based on the average cost, then the enterprise would have some interest in operating on an economic footing, i.e., to operate so as not to be classed among the uneconomic enterprises. However, we will, for some time to come, have to accept the existence of unprofitable enterprises; these, however, will have to begin economically sound operations in the future.

An enterprise will be interested in income, profit, and plan fulfillment if the system of reserve-fund formation for communications enterprises is re-studied. We believe that the the communications enterprise reserve fund must be created from incomes produced within and in excess of the plan; this after all is the practice in industry. The efforts of the enterprises to fulfill and overfulfill the plan will be encouraged through the funds

of the enterprise. At the present time there is no such stimulus and the amount of profit is completely immaterial to the enterprise.

As far as the tariff-income plan is concerned, we should make every effort to stimulate not only the overfulfillment of the plan, but also the completion of the plan; the reason for this is the necessity to maintain a degree of uniformity in the measures designed to spur production, i.e., to stimulate production as well as overproduction, and this will give the enterprise greater interest in meeting the targets of th tariff-income plan.

The amounts to be returned to the enterprises must be determined with the interests of the state and the workers kept in mind; we must avoid any sudden or unjustified increases in the funds of the enterprise. It seems that this system of independent financing, if we bear in mind what was said above, will most closely approximate the industrial system , both with respect to its nature and its efficiency.

R. N. MANYAKHINA, senior economics engineer of the Odessa Telegraph and Telephone Office.

V. K. BAZYK, candidate of Economic Sciences.

THE ORGANIZATION AND OPERATION OF THE MEANS OF COMMUNICATION

Measures Concerning the Regulation of the Wages of Communications Workers

The USSR Minister of Communications, N. D. Psurtsev, has issued an order No. 230 which determines the manner of carrying out the directives of the party and government concerning the adjustment of the wages for communications workers.

To effect the transition of the communications workers to new conditions of payment for work, the USSR State Committee of the Council of Ministers for Problems of Labor and Wages, together with the VTsSPS (All-Union Central Council of Trade-Unions) will ratify a number of important documents which were submitted by the USSR Ministry of Communications.

These include, first of all, a rate-qualification handbook which will give the characteristics of each major

skill and the requirements for each qualification class (category). On the basis of these requirements each communications worker in the major skills must be assigned to the corresponding qualification class (category). The material needed for determining the projected new pay rate for communications workers must be carefully compiled, and for this purpose each enterprise must have on hand data concerning the actual distribution of the workers of each profession into qualification categories, the wages which each receives and the work each of them performs.

To determine what salary is to be paid to any supervisor or engineer-technician in accordance with the directive of the party and government, the USSR State Committee of the Council of Ministers for Problems of Labor and Wages will set up indicators according to which each communications enterprise will be categorized into a certain group (class); here the size of the enterprise must be taken into account. The existing classification indicators, which were established 10 year ago, are outdated, do not satisfy present needs, and fail to allow for increased mechanization of communications enterprises. Instead of the various field indices which are now in effect, a single classification index for all communications enterprises, regardless of the field in which

they operate, is introduced--production volume, in terms of money.

Some groups (classes) will be assigned to each communications enterprise, in accordance with the new indices, and, based on this, the pay rate for the director of the staff and the engineer-technicians of a given enterprise will be established. In reality, it will be the task of the ministers for communications of the soviet republics to separate the communications enterprises into groups (classes) according to the wages established by the USSR State Committee of the Council of Ministers for Problems of Labor and Wages and the VTsSPS (All-Union Central Council of Trade-Unions).

The ministers for communications of the soviet republics, the heads of oblast, kray and republic (in the ASSR (Automonous Soviet Socialist Republic)) communications administrations, and the directors of communications enterprises must, as a first step, determine the production volume for each enterprise for 1959; this must be based on the various services and monetary estimates called for as of May 23, 1959. Here, great care must be exercised to give correct data with regard to the rate of exchange and the volume of production in terms of money.

The USSR State Committee of the Council of Ministers for Problems of Labor and Wages has already given its general position concerning bonuses for workers in major skills at operating communications enterprises. Thus, each communications enterprise in coordination with the local trade-union committee must develop specific conditions for determining worker bonuses and must take into account local conditions. This new position provides for bonus payments of as much as 25% of the monthly wages (salaries); the bonuses will be differentiated for specific skills and geared to the work actually performed. The bonus will be paid from the general wage fund and so long as the funds are available, i.e., without limiting the bonus fund to two percent, as was the practice up to now.

In executive sessions the directors of the enterprises, organizations and ministries for communications, when discussing the size of the yearly wage fund, must include according to the bonus system established, the sums neccessary to cover the bonuses of the workers in the major skills, and those of the directors, engineers and technicians.

Together with the VTsSPS (All-Union Central Council of Trade-Unions) and with the participation of the Council

of Ministers of the Soviet Republics, the USSR State Planning Commission, the USSR Ministry for Communications, and the USSR Ministry of Finances, the USSR State Committee of the Council of Ministers for Problems of Labor and Wages will establish the regional pay rates for the workers in communications enterprises in the northern regions, in Eastern Siberia, and in the Far East, and also for those workers in separate enterprises which are located in other areas with poor natural and climatic conditions.

The wage rates for those communications men working in mountainous regions at altitudes of 1,500 meters and above will be increased. The specific wage rates of the workers in communications enterprises which are located in mountainous, desert, and dry regions are determined by the Council of Ministers of the Soviet Republics in conjunction with the USSR State Committee of the Council of Ministers for Problems of Labor and Wages. The Ministers of Communications of the Republics, on whose territory mountainous, desert, and dry regions are located, must determine, in the Councils of the Ministers of the Republics, the incentive pay that the workers in these regions are to receive.

The wages of station and line riggers (supervisors),

cable splicers, battery tenders, line-maintenance men, radio and television repairmen, and of other qualified workers in communications enterprises are now determined from a 6-category rate scale, which was set up for the workers in the machine construction industry, in which the hourly wage rate of a 1st-category worker under normal working conditions is 2 rubles 63 kopeks (for a seven-hour work day); here we have a 1:2 spread between the lowest and highest categories.

Communications workers working under dangerous conditions, e.g., cable splicers, will be remunerated at a higher rate (by 15%). The linemen who carry out major repairs on line equipment, the cable riggers and others may be transferred locally to piece-work payment if conditions warrant. In this case also, the hourly wage rate is increased by 15%.

The adjustment of the wages of the workers in the oblast, kray, and republic (in the ASSR (Autonomous Soviet Socialist Republic)) communications management apparatus, as well as those of the workers in the apparatus of the communications ministries of the soviet republics will be carried through in 1962, simultaneously with the transfer of the workers of the state apparatus to the new conditions of work remuneration. The length-of-service raises for

workers in communications management offices remain in force until their wages are adjusted.

It should be noted that the salaries which have been established in accordance with the salary schedule for the type of work performed by the workers in the major skills are increased by: 10% for the men working continuously underground; 10% for the telephone operators in the information services of city telephone networks (junctions, stations) in Moscow, Leningrad, and the capitals of the soviet republics; 10 to 15% for the employees knowing and making daily use of foreign languages; 15% for the employees directly occupied in the transportation of radioactive and ionizing substances.

The team (brigade) leaders, senior telegraph, radio, and telephone operators will receive a salary that is greater than the salaries of the highest class (category) of workers in the team (group) under their command by: 10% when the team consists of 5 to 10 men, and 15% if the team consists of more than 10 men.

The telegraph, radio, and telephone operators who are employed in international communications, as well as postoffice workers and mail sorters who are continuously occupied in processing international mail, telgraphic communications and foreign literature, will receive a

salary 10% greater than that provided for in the schedule for the workers of corresponding skill and qualifications (this does not exclude the possibility of an addèd bonus for the use of foreign languages in their work).

These new wage rates affect the communications workers of all segments of the national economy, regardless of the departmental jurisdiction of the enterprise and organization which employs them.

The communications ministries of the soviet republics must estimate what additional wage funds are necessary for the adjustment of the salaries, and present a substantiated request to the Council of Ministers of the republics. It should be noted here that at least 20% of the required sums must be sought from the internal reserves, i.e., as a result of an increase in labor productivity. Consequently, the task ahead is to develop effective measures designed to find and utilize internal sources of revenue in order partially to cover the additional requirements of the wage fund; these arise as a result of the transfer of the workers of the operating communications enterprises to the new wage rate.

The communications ministries of the soviet republics, communications management organizations and enterprises must be guided by the recommendations of the

board of the USSR Ministry of Communications concerning the reserves achieved through increased labor productivity and their utilization in the field of communications when developing the measures to find the funds necessary for the adjustment of the wages.

The exact dates of the introduction of the new wage scales will be determined by the Council of Ministers of the soviet republics and the corresponding trade-union organizations for each enterprise.

The first wages to be adjusted during the current year are those of the mailmen. Further, it would be well to adjust the wages of the communications workers by enterprises, as provided for in the directive of the party and govermment. Here, we take into account the enterprises' ability to operate under the new conditions. It is recommended to encourage the initiative of individual communications collectives which are engaged in finding the funds needed for the wage adjustment from internal reserves, and these collectives should be the first to be transferred to the new wage scale.

Wage adjustment for communications workers will take place gradually during the period from the second quarter of 1960 to the third quarter of 1961 inclusive. All the preparatory work for the wage adjustment must be

assigned to qualified specialists, under the direct supervision and personal responsibility of the directors of the communications enterprises and with the participation of the party, trade-unions and Komsomol organizations.

N. I. BAKhGORSKIY, Head of the
Department of Labor and Wages
of the USSR Ministry of Communications

IN RESPONSE TO THE CONCERN OF THE PARTY AND GOVERNMENT

With each passing year the life of the communications workers of our nation becomes better. The party and government care for them continuously as they do for the entire Soviet people. Many thousands of communications men have already switched over to the seven-hour working day. The newest clear expression of the wish to better the material well-being of communications workers is the recent decision of the party and government to adjust the wages of the communications workers. This decision has brought about the warm approval of the enormous army of the communications workers of the Soviet Union.

The communications collective of the SURKHAN-DAR'IN OBLAST (UZBEK SSR) expresses its deep gratitude to the party and government and to comrade N. S. Khrushchev personally for their concern for the communications workers, and promises, through tireless labor, to raise continuously the quality of the work and ensure the overfulfillment of all projected tasks of the second year of the seven-year plan.

The chief of the switchboard room of the Central International Telephone Station, L. V. Gurkina, discusses with the telephone operators the new system of wages for the communications workers. From left to right: V. P. Saltykova, T. N. Anan'yeva, Ye. V. Bogatkova, V. A. Kalygina, V. M. Usanova, L. V. Gurkina.

The communications workers of the ROVENSK OBLAST hailed the decision of the party and government as showing great concern for the communications workers. They take it

upon themselves to better appreciably communications operations in 1960, and assure the party and government that their kindness will be properly repaid by the labor of the workers.

The workers' collective of the VITEBSK BUREAU of COMMUNICATIONS greeted the decision of the adjustment of the wages of the communication workers with great enthusiasm. The Vitebsk communications men have resolved to raise the labor productivity, better the qualitative indices, and to fulfill and overfulfill the goals of the plan.

The decision to adjust the wages of the communication workers has brought about great enthusiasm and happiness in the collective of the YEREVANSK POST-OFFICE. This decision --so says a letter which was sent to the USSR Ministry of Communications by the workers' collective of the Yerevansk Post office --is the expression of the concern of our Communist Party and of the Soviet Government for the increased well-being of the nation's communications men.

This is a great incentive for furthering the creative initiative of all communications workers in their struggle for early fulfillment of the governmental revenue plan, increasing the

quality of the communications operations servicing the government, national economy and population.

This great concern on the part of the party for the welfare of the people -- the letter continues -- inspires us to a continued effort on behalf of the glory of our powerful socialist Motherland, in the name of the victory of communism in our country. With a feeling of deep gratitude toward the party and the government, the workers at the Yerevansk Post Office state that they will apply all their efforts and fulfill with honor the increased socialistic responsibilities which were assumed by them in honor of the 40th anniversary of the establishment of Soviet control in Armenia.

Similar reactions have come from the communications workers of the KhMEL'NITsK OBLAST (UKRAINIAN USSR), the ADLERSK BUREAU of COMMUNICATIONS (KRASNODARSK KRAY), the USMANSK BUREAU of COMMUNICATIONS (LIPETsK OBLAST), the RUBEZhANSK BUREAU of COMMUNICATIONS (LUGANSK OBLAST), the workers of the 10th COMMUNICATIONS DIVISION of the town of KURGAN, and from many other collectives.

All communications workers are resolved to respond to the great concern of the Communist Party and Soviet Government for the betterment of their

welfare through concrete action, and to make a worthy contribution to the great task of communist construction in our land.

FLOW LINES FOR THE PROCESSING OF PRINTED MATTER AT THE MOSCOW POST-OFFICE

The Moscow post-office is one of the largest forwarding enterprises; here is sorted (distributed) the printed matter which is not sent to the news centers of the Soviet Union by the printers themselves.

The printed matter entering the Moscow post office passes through the following basic stages: from the trucks into the sorting group, into mail carts, sorting according to destination, tying of the bundles, insertion into bags, tying of the bags and their delivery to trucks over conveyor belts.

Printed matter addressed to news distribution centers is sorted by either the compartment or selection method. The first method is the more labor consuming: placing the editions into the cabinet compartments which correspond to specific news centers, the sorter must walk continuously along the cabinet

while holding a heavy bundle in his hands. With the selection method, the sorter makes a stack of the printed matter for each center directly from all the titles using a table or special benches. This method has more advantages than the compartment method, but here also the operation is carried out by hand: the collection of the package, its transfer to the packer, tying and insertion of the bundles into bags; these must again be hand carried to the outgoing conveyer.

The most modern method of processing printed matter is the flow method. The application of this method lightens the labor of the workers and increases labor productivity.

Post office lines are now in operation in a number of forwarding offices located directly at the publishing houses. There are, in addition, several projects which have been developed by the TsNIIS (Central Communications Scientific Research Institute), "Giprosvyaz'" (State Institute for Designing and Planning of Communications) and other organizations. None of these post office lines, however, provide for the processing of a great number of titles.

As a result of the methods worked out in the technical-economic laboratory of the Moscow post office,

two flow lines which can handle a great number of titles have been set up in the 14th forwarding office of the post office. Their operation is organized in the following manner.

The printed matter which arrives from the printers is stacked by the distribution group, and here a worker selects the printed matter according to mail cars, i.e., prepares the so-called lot. This operation involves the use of a special invoice. The lot consists of a set number of standard bundles and "remainders" (i.e., printed matter copies which will later be tied on bundle-tying machines). The lots are fed as needed to the conveyer-table of the flow line, moving along this table toward the sorters.

The conveyer-table consists of a conveyer belt 650 mm wide which moves along steel sheets supported on a wooden structure. On both sides and level with the conveyer are located 400 mm-wide benches covered with steel sheets. Next to the benches are tables on which the printed matter is stacked according to titles. The height of the conveyer,

benches, and tables is 920 mm. The table is 1 m by 2 m.

The flow line for processing of printed matter in the 14th forwarding office of the Moscow post-office.

The sorter assembles the packages for the centers according to the invoices in his possession, and a separate invoice is drawn up for each center. The invoice shows how many copies of each edition of each title are to be mailed to each center. Having assembled the amount of printed matter required by the news center,

the sorter checks off the consignee on the news-center list and pushes the completed bundle onto the belt of the conveyor-table. If at the same time bundles of the next lot are being fed to another sorter over the conveyor, the completed bundle is placed between them.

Shortly before completing the sorting of the lot the sorter notifies the head of the unit that he is ready for the next batch of printed matter. Following the processing of the printed matter of a given lot, the sorter notes the number of rejects, since in the case of too many rejects there may not be enough newspapers or magazines for the last centers, while, on the other hand, the sorter might be left with extra copies.

The completed bundle is fed to the bundler over the conveyer. Bundles are tied on bundle-tying machines MVGU-5 or LUP-2. The bundler removes the bundle by its lower liner from the conveyor-belt, switches on the machine, and ties the bundle. After this, the bundle, carried by the conveyor, reaches the packer who stands to the side of the conveyor-table. He removes the bundle from the belt, glues the label on the bag, inserts the bundle into the bag, and pushes it onto the belt of the conveyor-table.

Further on, the bag is moved to a short storage conveyer, and from it to a semiautomatic sewing machine of the MZP type.

The sewing machine operator has only to turn the bag under and place it into a special guide on the machine. The sewing of the bag proceeds automatically, following which the machine is switched off, and the finished bag is fed to a stacking area by the conveyer. The stacking is done by a special worker--the distributor--who removes the bags from the belt at the place reserved for the printed matter going into a specific mail car. At the scheduled time for mailing, a worker of the transportation forwarding office feeds the bags to trucks over a system of conveyer-belts.

In the course of the planning, development and introduction of the flow lines to the forwarding offices of the Moscow Post Office the following fundamental factors were determined.

The area required for stacking the printed matter in the distribution group. This calculation is done on the basis on the hour of peak load, which is determined by plotting a graph of the arrival of the newspapers into the distribution

group and a graph of the per-hour dispatching of these newspapers to the post-office lines. On the basis of these two graphs we derive a third graph, each hour ordinate of which is equal to the difference between the ordinate of the first and second graph. The peak quantity of newspaper bundles which will be found at any time in the distribution group is obtained from the third graph.

Having determined the number n of newspaper bundles for the hour of peak load, we find the area required for stacking to be

$$F = k \frac{nf}{r} m^2$$

where f is the average area occupied by a single newspaper bundle, k is the coefficient for the aisles (k equals 1.5 to 2 depending on the number of bundles and their distribution), and r is the number of rows of bundles, which depends on the permissible stacking load.

The area required for stacking magazines is determined in a similar manner.

The accumulation of the bundles of printed matter at the work station where they are tied. As a rule, on all post-office lines, the material being processed moves

along a conveyer from one operation to the other in a sequence determined by the technology and with a definite rhythm. Smooth operation is obtained only in those cases where the processing capacity of each section of the flow line has been accurately calculated.

It must be noted that the flow line for the processing of printed matter is not an automatic flow line, and its rhythm is dependent on the labor productivity of the workers. The labor productivity of different workers cannot be absolutely identical. Consequently, in order to maintain a certain rhythm on post-office lines, it is necessary to create a reserve of printed matter (a certain accumulation) for each worker on the line, thus evening out this nonuniformity in productivity.

This nonuniformity is aggravated in processing of printed matter by the continuously-varying duration of the collection of the printed matter for a center, since a different number of copies of each edition is being mailed to different centers, and the number of titles also varies. In the 14th forwarding office of the post-office the number of titles varies from 1 to 40 depending on the center, while the number of copies varies from 1 to 500. Because of this the creation of

a reserve at each work station where the bundles are tied acquires even greater importance.

A reserve cannot be accumulated automatically, since the bundle will fall apart on passing from the conveyor to a stationary surface. On the other hand, the conveyor cannot stopped, since this will result in a sharp disturbance of the rhythm; during the stoppage of the conveyor, the collected bundles will be placed much too close to each other.

How then can we create a reserve at the station of the bundler? The work of the bundler is of a rather rhythmic nature; he can remove from the conveyor, tie, and push onto the belt of the conveyor 200 to 250 bundles per hour, or 3 to 4 bundles per minute. Five or six sorters can assemble in one hour a smaller number of bundles. Observations have shown, however, that because of the unevenness of the amount of printed matter being assembled for different news centers, there exist, during the hour, peak minutes during which 5 or 6 bundles per minute are placed on the belt by the sorters. At such moments the tier must remove some bundles from the conveyor without stopping it and without tying the former, and set these bundles aside. Tying of the bundles which were

set aside should begin when the bundles are again fed at intervals permitting normal tying operations.

The speed of the conveyor belt in the flow line. In the general case, the speed of the conveyor belt in the flow line may be selected at random, since the distance between bundles depends on the speed with which they are assembled by the sorters, and not on the speed of the conveyor. Since the time needed to assemble different bundles varies, the distance between assembled bundles will vary. Consequently, the speed of the conveyor belt must be adjusted to the tying operation.

With an average bundle length $\underline{l}$ = 0.3 m and a minimum interbundle distance $\underline{a}$ = 0.3 m and a bundle-removal time $\underline{t}$ = 3 sec, the speed of the conveyor belt for a single bundler will be $\underline{v} = \frac{\underline{a}}{\underline{t}} = \frac{0.3}{3} = 0.1$ m/sec.

If two bundlers are working simultaneously, $\underline{v}$ = 0.2 m/sec.

The assembled bundles, even in the worst case, follow each other at some distance. Thus the speed of the conveyor may be set at $\underline{v}$ = 0.3 m/sec.

Using the conveyor of the flow line to feed the bundles of printed matter to the sorting stations.

The calculations which were carried out in the laboratory of the Moscow post-office, and the working experience acquired on the flow lines of the 14th forwarding office have shown that there exists a possibility of the utilization of the conveyor of the flow line to feed the bundles of printed matter to the sorting stations instead of using for this purpose a special sorting conveyer which is provided in the experimental flow lines developed by the "Giprosvyaz'" (State Institute for Designing and Planning of Communications).

It has been determined from calculations that with a conveyor speed of $v = 0.3$ m/sec and a distance between bundles of $a = 1$ m the conveyer can move in one hour

$$n = 3600 \frac{v}{a} = 3600 \cdot \frac{0.3}{1} = 1080 \text{ bundles.}$$

With an average number of copies of editions in an assembled bundle, i.e., 280 newspapers or 67 magazines, while it is 400 newspapers or 58 magazines for a standard bundle, and with the magazines amounting to 17% of the entire printed matter, about 300,000 copies of printed matter per hour

may be moved over a single conveyor as was shown by calculations.

Thus, if 300,000 copies of printed matter are processed per hour on the flow line, it becomes possible to do away with the additional sorting conveyor, which greatly reduces the cost of the flow line and simplifies its servicing.

Sorting the printed matter according to news distribution centers. The best conditions for the work of the sorter are those when he processes newspapers (magazines) of one or at the most of a few titles. There are a few projects using several variants of this type of operation.

The simplest of these variants is an increase of the number of invoices in relationship to the number of sorters. In this case, each sorter selects those copies of printed matter whose titles have been assigned to him and stacks them on the bundle which is fed to him over the conveyor from the preceding sorter. With this method, the quantity of documentation increases several fold.

The TsNIIS (Central Communications Scientific Research Institute) and the "Giprosvyaz'" (State Institute for Designing and Planning of Communications) have developed another variant where the sorters exchange

bundles, i.e., the bundles are moved by hand from one worker to the other. Here, the sorter, having received the next bundle, removes the invoice which was attached to it, checks on this invoice the newspapers (magazines) bearing the titles for which he is responsible, and places them, together with the invoice, on the bundle he has received; he then hands this bundle over to the next sorter. Here, the conveyor is used only for carrying standard bundles. This type of operation is hardly convenient, since with it we will observe different sorters idle at various times because of the great nonuniformity in the number of titles and copies of printed matter which are being mailed to different centers. Moreover, moving the assembled bundles along the benches requires additional effort on the part of the sorters.

Calculating the number of work stations. The number of the sorting stations on each flow line must be determined from the labor productivity of the sorter and the mailing schedule for the printed matter. The number of the bundlers required is determined from the volume of the work at the hour of peak load, the capacity of the machines and the percentage of standard bundles.

The need of work stations for the insertion of the bundles into bags is determined in a manner similar to that for

calculating the number of tying stations; here we must take into account the number of standard bundles and the labor productivity of the inserter.

In addition to all the above it is necessary to take into account the following circumstances when planning post office flow lines.

When several groups of workers are consolidated into a single flow-line team, the plan of processing must be checked to provide a smooth and approximately uniform load of processing of each mail cart.

The operation of a flow line requires carefully thought-out organization, detailed instruction of the workers at each station, effective control of the workers by the head of the team, the ability on the part of the head of the team to orient himself on the spot, and to make the necessary decisions called for by a given situation at any given moment, and even to shift the workers to different positions.

The introduction of the flow-line method of processing printed matter will make it possible to lighten the labor of the workers and simultaneously increase productivity. If the above-mentioned conditions are fulfilled a labor-productivity increase of 18 to 23% may be attained on the flow lines.

V. A. BRUKER, senior engineer
of the Technical-economic Laboratory of
the Moscow Post office,
P. I. YuRASOVSKAYa, engineer.

COMBINING THE DUTIES INVOLVED IN SERVICING COIN-OPERATED TELEPHONES

The telephone system of the city of Riga is carrying out an experiment where coin-operated telephones are being serviced by the driver of a car who has the duties of chauffeur, inspector, and collector, and also sees to the cleanliness of the telephone booth.

This method, which is a sharp deviation from current practice in the technical servicing of telephones, makes it possible to reduce by 40% the number of workers needed for this task, and also to dispense with the services of a special collector.

Usually, the sector is serviced in the following manner. At the beginning of his working day, having received the data pertaining to the operation of the coin-operated telephones, the inspector makes the round of his sector. He checks whether the telephones are in good working order, repairs any damage, and dusts them. If the telephone cannot be repaired on the spot, it must be taken to the repair shop.

The sectors of Zadvin'ye and Bolderay, where 78

coin-operated telephones are installed, were selected for servicing by the new method. Of these 78 phones, 27 are located in lobbies and entrances, and 51 on the street; of these, 26 are in booths and the rest on the walls of houses.

Prior to this, this sector was serviced by two inspectors and one cleaning woman. Collection was done by specially selected individuals. This sector is now serviced by one man--the driver of a "Moskvich" car, A. Ya. Druva, who has studied the mechanism of coin-operated telephones and the methods for servicing them, including repair.

In the course of the work two methods were tried out in that sector. With the first method the inspector first collected the coin boxes, turned them in immediately, and then proceeded with the technical servicing. With the second method collection is done simultaneously with technical servicing, and the inspector turns in the coin boxes at the end of his working day.

The first method proved to be unadvantageous and was discontinued, so that the second servicing method is in use now.

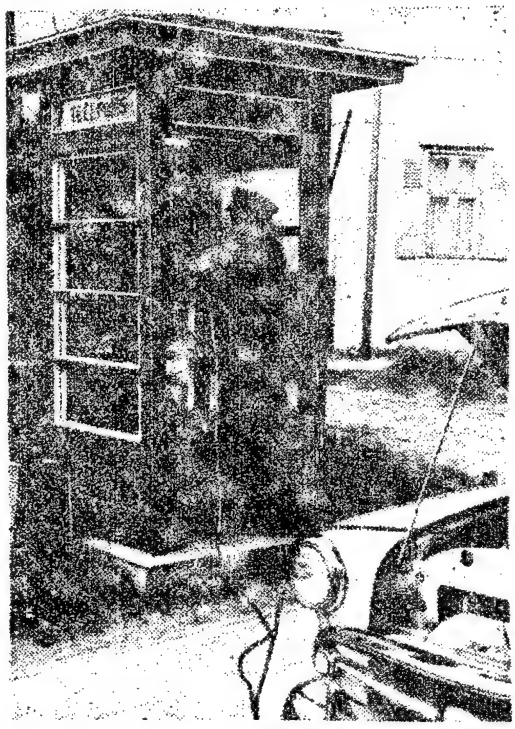
The observations which were carried out over a

period of 18 months show that it takes the inspector 2 to 3 minutes to drive to the coin-operated telephone, 2 to 3 minutes for its servicing (checking whether it is in working order, dusting it, and cleaning the booth), and 1 to 2 minutes for collecting the money (as planned).

Naturally, the servicing time is greater when repairs are needed, and this happens, on the average, three to four times a day. Most frequent damage occurs in the handsets, dials, and buttons. The time needed to repair damage of this type ranges between 10 to 15 minutes. Eliminating "clogging of the coin boxes" together with servicing takes as much as 5 minutes. The inspector makes all the repairs on the spot, including soldering, which is accomplished with the aid of a 12 v soldering gun operated from the battery of the "Moskvich" car.

In the Zadvin'ye and Bolderay sectors, where, as was previously noted, 78 coin-operated telephones are in operation, the collection, in accordance with the data furnished by the pay-phone group, was carried out in the past according to the following plan (see table).

Number of coin boxes	How many times each coin box was replaced each month	Time spent each month for replacing coin boxes
10	8	11 h. 20 min.
11	6	7 30
11	3	1 45
22	2	4
24	1	5



Supervisor A. Ya. Druba repairs a telephone—solders a broken wire with the aid of a special soldering gun connected to the battery of the "Moskvich" car.

In addition, approximately 10 minutes were spent each time to obtain the keys and the money boxes, and 15 to 20 minutes were spent in turning them in, i. e., approximately 12 hours per month.

Following the organization of combined servicing this plan of the replacement of the money boxes did not prove fully suitable, since on certain days a substantial, general overloading occurred, and the inspector was not always able to make the rounds of all the coin-operated telephones.

It was therefore proposed to remove the money boxes on the basis of the overall number of monthly removals divided by the number of working days, which amount to

$$\frac{10 \times 8 - 11 \times 6 - 11 \times 3 - 22 \times 2 - 24 \times 1}{24} \approx 13 \text{ removals/day.}$$

Thus, the supervisor will spend during his working day:

in driving to the coin-operated telephones: (2 to 2.5 min) x 78 $\approx$ 160 to 200 min., i.e., from 2 h 40 min. to 3 hrs 20 min.;

for servicing: 2 min x 78 $\approx$ 160 min, i.e., 2 hrs 40.

min;

for collection: (1 to 1.5 min) x 13 ≈ 13 to 20 min;

to repair damage: approximately 1 hr;

for obtaining the data pertaining to the route, the key,, the money boxes and for reporting: from 30 to 40 min.

The total is thus 8 hours.

Working experience has substantiated the accuracy of these calculations: on the whole, the inspector is able to complete the work mentioned above. Since A. Ya. Druba has been working in accordance with the new method not a single complaint of malfunction of the coin-operated telephones has been received. The combined servicing has made it possible to increase labor productivity while maintaining good quality, lighten the work of the communications worker, and free two of the civilian units in the Zadvin'ye and Bolderay sector.

The directors of the Riga GTS (City Telephone System) are planning to organize combined servicing in two more sectors where 178 coin-operated telephones are installed. This will make it possible to free four more civilian units.

In the central part of the city the coin-operated telephones are located close to each other, and, for this reason, their operation will remain temporarily unchanged

until more experience has been accumulated.

L. M. Litvinskiy, Senior Engineer of the Riga GTS (City Telephone System),

Ya. B. Magina, Senior Technician.

THE INTRODUCTION OF TERMINATING SETS (SORS SINGLE CURRENT COMMUNICATION OPERATIONS BAY) FOR STA EQUIPMENT

(As tried by the Gor'kiy telegraph office)

Voice-frequency telegraphy is being widely introduced into the telegraph offices of the nation, while at the same time equipment in the apparatus services is being unified. The cumbersome and obsolete Baudot apparatus is being replaced with domestic high-speed ST-35 and STA apparatus. In making this substitution, it becomes necessary to increase the number of panels, and consequently the number of STU (abbreviation not available: can stand for 'voice-frequency control bays') (SORS) bays. To locate these bays in the LAZs (line-equipment rooms) of the voice-frequency telegraph service requires additional space, causing some inconvenience in servicing communications.

In view of this, N. Ye. Rudoy and M. A. Chizhov, rationalizers in the Gor'kiy telegraph office, suggested that each operating point of the apparatus service be equipped with a STU(SORS) panels.

Installing the STU(SORS) panels at the telegraph operators position, in close proximity to the STA receiving

and transmitting apparatus, permits a strict division of duties between the technical personal of the apparatus and voice-frequency-telegraph services. It becomes possible for the technicians of the apparatus service to complete the entire cycle of adjusting the link at the operating point, in doing so monitering the quality of the double-current signals transmitted to the voice-frequency channel. At the operating point of a given link, it is also possible to monitor the quality of the signal passing through the voice-frequency channel.

When the suggestion of Rudiy and Chizhov was put into practice, the results were good. There was a considerable decrease in the time spent in adjusting and testing the links, since this was now done completely in the equipment room, ending the arguments between the technicians of the apparatus service and the voice-frequency service as to why a given message did not get through.

A great deal of material was not required to carry through this measure

Figure 1 shows an operating position equipped with terminal telegraph devices. On an/small instrument (rheostat) panel, a relay was installed (receiving or sending), clamped to a/metal support (a tube). Inside the panel, all the parts required to convert from single-current working to

double-current, and vice versa, were mounted. The front of the panel was somewhat modified (Fig. 2); additional terminals were mounted, and the single-pole changeover switch was replaced with a double-pole switch. The circuits of the receiving and transmitting sections of the terminating set were arranged as shown in Figs. 4 and 3, respectively. These circuits are quite simple, and no explanations are required.

If after the operating position has been reequipped it is desired to disconnect the adapter termination, the jumper (conductor) between terminals 3-7 should be removed, terminals 3-8 jumped, the relay removed from the terminal block, and the changeover switch thrown to the left-hand position.

All the wiring, with resistors and spark suppression circuits, can quite easily fit inside the instrument panel; thus its dimensions can remain unchanged. A 3000-ohm potentiometer is used to make the proper current flow through the compensating winding of the transmitting relay; the moving contact of the pot is exposed at the end of the panel. The relay-contact filters can be liberated from old SORS bays, or newly manufactured ones can be used.

It is easy to make a filter in the following manner. The capacitors take the form of a capacitor assembly with

one common terminal (sheet); they are made from 45-mm wide capacitor tape. Such tape has a capacitance of 0.065 microfarad per meter. The assembly will include two 0.1 microfarad capacitors and two 0.01 microfarad capacitors. To obtain such capacitances, 340.4 cm of capacitor tape will be needed; 15.8 cm from either end, one of the tinfoil sheets is slit and a lead formed; after this is done, the slit should be 4 mm wide, and the sheet 15.4 cm long. Next, a second cut should be made in the same capacitor sheet at a distance of 15.8 cm from the first cut, and a second lead formed. From the second slit, go 154.4 cm along the strip and make still another cut and form a lead. Finally, a lead is made at one end of each of the capacitor-tape plates(sheets). Thus we have a tape consisting of four capacitors with five leads (Fig. 5a). It is rolled up, plunged briefly into melted paraffin, and placed in a small press, where it should remain until the paraffin is set. The roll will emerge from this process flat and 40 mm wide.

The windings of both induction coils are formed of 130 turns of PSh0-2-mm wire. The coil form is a paper sleeve 10 mm in diameter. The coil is "pie-wound" between temporarily installed retaining disks, and is 5 mm wide. After the coil is shellacked, the

disks are removed.

The resistors are 625 ohm, 0.5 watt Type VS or MLT resistors.

After this, the filter is assembled from these parts according to the circuit given in Fig. 5b; it is placed in

Fig. 1

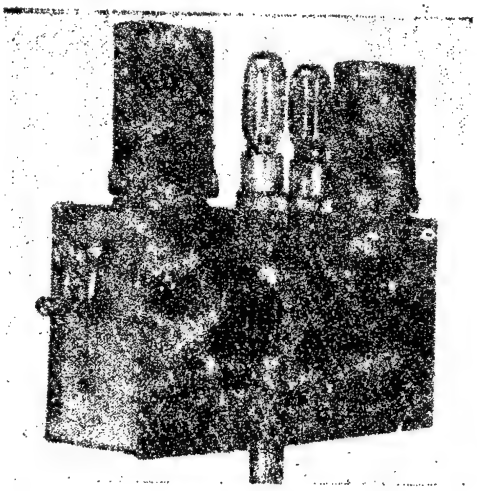


Fig. 2

a metal case (Fig. 5c), holes are made on top for the contact conductors, and the filter is filled with paraffin.

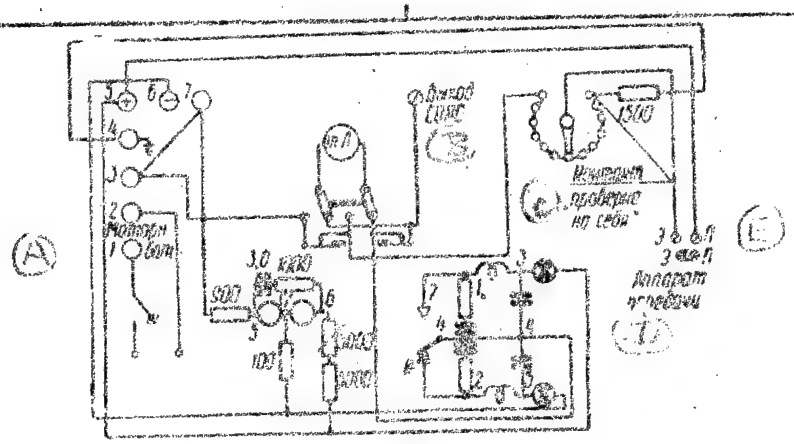


Fig. 3. A) Motor bat.; B) SORS output; C) "self-testing" contact; D) transmitting apparatus; E) ? G; F) ? B+.

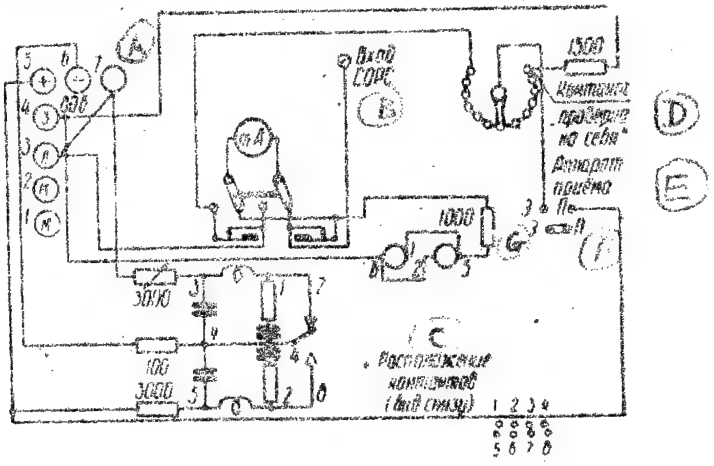


Fig. 4. A) 80 v; B) SORS input; C) arrangement of contacts (see below); D) "self-testing"contact; E) receiving apparatus; F) ? B+; G) ? G.

In numerous assemblies made by the described method, isolated deviations from the rated values were found when the inductances and capacitances were measured; they did not exceed 3 to 6%, however, which is completely satisfactory.

In converting to operation without printed monitering, i. e., to two-way (duplex) reception and transmission of telegrams over a single apparatus, the problem of shifting the terminating equipment directly to the telegraph operator's position may be solved in two ways--either by installing two instrument panels (two converter panels), or by incorporating the receiving and transmitting converter panels into one enlarged instrument panel. In the latter case, the switch for loop-checking the apparatus and SORS panels is mounted on the end of the instrument panel, while a two-deck, four-position, four-button changeover switch for shunting the milliammter is mounted on the front of the panel. This permits the same

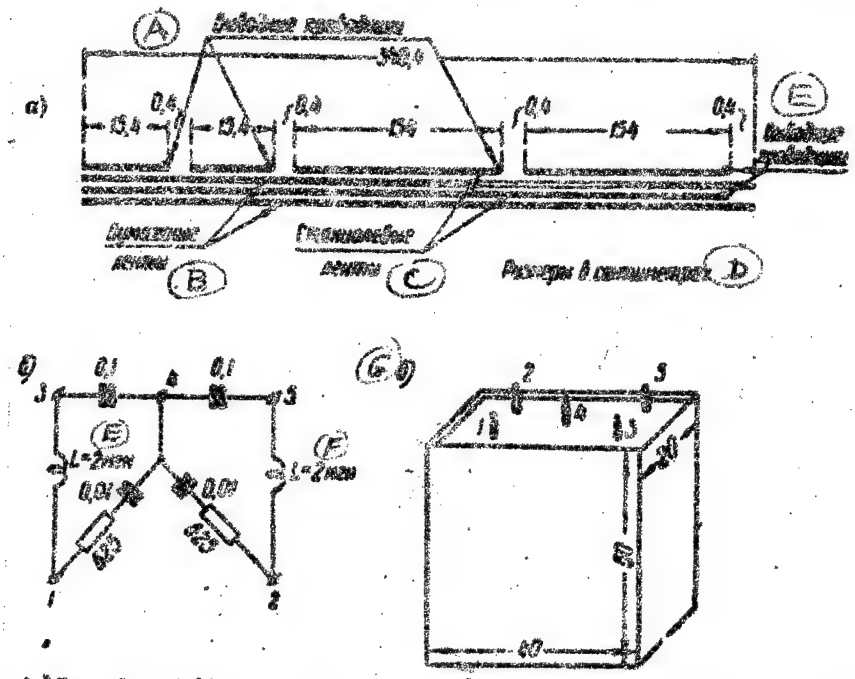


Fig. 5. A)Leads;B)paper tapes;C)foil tapes;D)dimensions, cm; E)leads;F)L=2 mh;G) b.

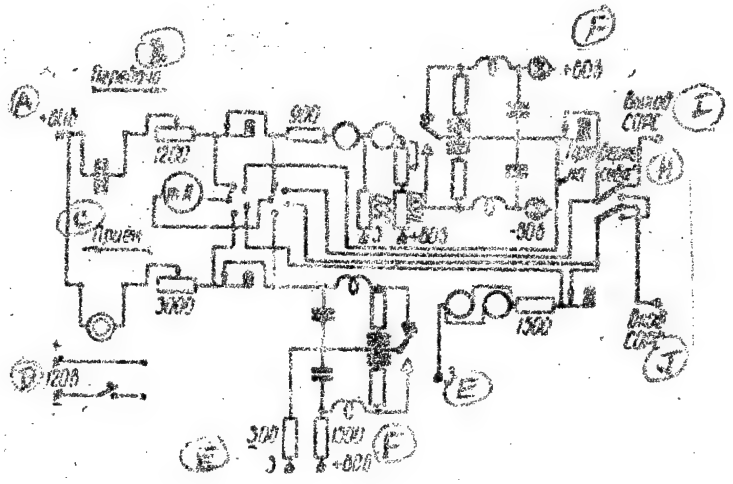


Fig. 6. A) +80 v; B) transmission; C) reception; D) 120 v; E) ? G; F) +80 v; G) -80 v; H) "self-checking"; I) SORS output; J)SORS input.

milliammeter to measure the current in both the receiving and transmitting panels; it performs all the monitoring required to service the link. The basic circuit of the receiving and transmitting conversion panels, as mounted on one instrument panel, is shown in Fig. 6.

The arrangement of parts and panel construction for half-duplex operation is similar and so will not be considered here.

A year's trial operation of conversion panels with the design described, located on instrument panels near the STA equipment gave quite positive results. Thus there is no longer any need for the cumbersome, inconvenient-to-operate, expensive STU bays.

B. I. Popov, Chief engineer of the Gor'kiy telegraph office

* * *

TIGHTENING QUALITY CONTROL IN THE MANUFACTURE OF REINFORCED*CONCRETE POLES AND SUPPORTS

During 1960, an extensive introduction of reinforced-concrete poles and supports was planned for aerial communications and radio lines, in the hope that by 1961 the use of wooden supports would be completely ended in treeless and lightly-forested rayons.

In this connection, it is necessary to tighten quality control in the manufacture of reinforced-concrete

poles and supports, and provide correct selection of type and length in accordance with the loads, line characteristics, and local meteorological conditions.

It has been found in practice that properly made reinforced concrete poles and supports bearing appropriate loads will last well for 50 to 70 years, requiring neither repair nor maintenance. Examples of pole and support durability are the poles set by engineer N. P. Lapin in Turkmen in 1924-1925 (Fig. 1), and the "Palliks" - type supports which he used in 1929 in Astrakhan (Fig. 2).

At the same time, in many places there were instances of installation of poor-quality line poles and supports.

Where lines have faulty supports which are not durable enough, owing to low strength or defects in the concrete, unnecessary and costly repair work will result, and sometimes even accidents to maintenance personnel. An example of rapid failure of supports owing to poor-quality concrete is given by the supports installed in 1955, only five years ago, in the city of Pushkino, of the Moscow oblast (see Fig. 3). The centrifuged poles obtained from the Grozniy plant, which were installed during 1955-56 on communication links in the Moscow, Tambov, Odessa, and other oblasts, also proved not

sufficiently durable or frost-resistant. One of these poles (Zagorsk LTU (abbreviation not available) is shown in Fig. 4.

The causes for the failures of concrete poles and supports shown in the photographs, occurring after so short a period of service, lie in the manufacturer's toleration of infractions of the technical regulations for the manufacture of concrete products, and the customer's oversight in not inspecting the products for quality, either during manufacture or upon receipt from the manufacturer.

In 1958, the reinforced-concrete products plant in the city of Zhukovskiy, of the Moscow oblast, made types PR-1 and CPR-23 for the Moscow oblast communications administration; among them there were found supports with continuous (through the entire thickness of the support) extended bubbles in the concrete, with tilted reinforcements, or with reinforcements turned through 90°, and with other defects. The Serpukhov LTU testing grounds sent reinforcing frames for type PR supports to another testing ground; the round steel reinforcing rods were joined lengthwise at the edge without welding and without the use of anchoring hooks at the ends of the rods.

Naturally, such supports did not provide the necessary stability for the line, and had to be replaced in a short

time.

For reinforced-concrete poles and supports to give reliable service throughout their entire intended service life (50 to 70 years), without requiring expensive repairs or replacement, there must be installed on the line poles and supports which conform in quality of manufacture to the specifications given in the "Instructions for manufacturing reinforced-concrete poles and supports under test-area conditions" (SvyazIzdat, 1959), and to the technical specifications for the production of this type of reinforced-concrete product.

In addition, beyond the dependence on the place where the poles and supports are made (testing grounds, shop, factory), as well as upon the technical equipment and qualification of the manufacturer, strict quality control for the products must be established by the customer, both during manufacture and upon receipt from the manufacturer. All finished poles or supports which are ready to be turned over to the customer should have been previously accepted by the quality-control division (OTK) of the manufacturing plant or by the official responsible for the quality of products made in testing grounds. Here an appropriate stamp, in indelible paint, should be placed

on the poles (supports).

In accepting finished reinforced-concrete supports and poles, the customer should check the external appearance and surface finish of the products, check all dimensions, and also check to see that the grade of the concrete in the products, as well as its strength in longitudinal and lateral bending, conform to the specifications of the instructions mentioned above, and to the working drawings.

In addition, the specimens selected for bend tests are checked for proper location of the reinforcing rods in the concrete by cutting a notch across one end of the specimen; the damaged portions are later filled with a cement solution.

Where suitable equipment is available, it is desirable to check the positioning of the reinforcing bars without damage to the concrete, i.e., by magnetic, ultrasonic and other methods.

In many cases, when large lots of types SPR and SPSh supports are received, it is not always possible to carry out strength tests at once, using two pieces and a stand. This is related to the fact that fastening two supports to a pole before testing, and then removing between the supports being tested, is

very difficult, and the pole and two supports are very heavy, requiring special hoists. Also, there may be no dynamometer in the vicinity for the forces required in testing the coupled supports.

Hence, as a temporary measure (until the necessary equipment is acquired) the strength of the coupled type SPR and CPSh supports can be checked in bending on the basis of one piece (in analogy to bending-strength tests for a type PR support or a pole). In this case, twice the number of supports are tested. The nominal, test (inspection) and limiting (ultimate) loads have the following

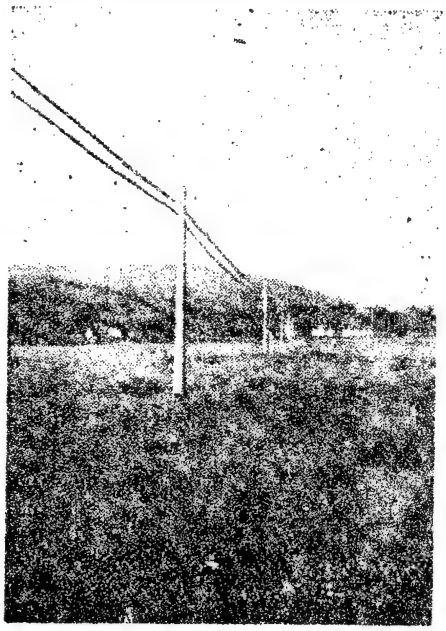


Fig. 1

Fig. 2

values in testing single pieces for types ~~EO~~SPR and SPSh supports (Tables 1 and 2).

Table 1. Bending moments of one type SPR support, mm

Type of support	Across the lines			Across the lines		
	Design moment M	Test moment M_t	Ultimate moment M_u, not less than	Design moment M	Test moment M_t	Ultimate moment M_u, not less than
SPR-2,3	0.17	0.19	0.	0.15	.17	
SPR-6,8	1.0	1.1	1.	1.5	1.65	

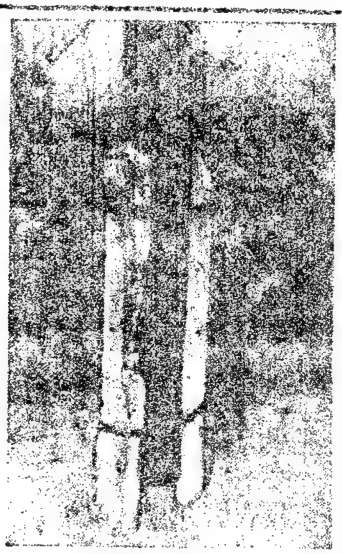


Fig. 3

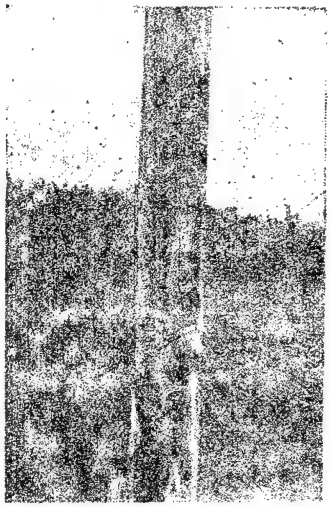


Fig. 4

Table 2. Bending moments of a single type SPSh support, mm

A) Type of support; B) toward the pole; C) from the pole; D) along the lines; E) design moment, M; F) test moment, M_t; G) ultimate moment, M_u, not less than; H) design moment, M; I) test moment, M_t; J) ultimate moment, M_u, not less than; K) design moment, M; L) test moment, M_t; M) ultimate moment, M_u, not less than; N) SPSh-1.25; O) SPSh-1.9; P) SPSh-275; Q) SPSh-4.4; R) SPSh-6.8.

The following formulas are used to determine the required forces: 1) for testing as illustrated in

Table 2

A Тип приставки	К столбу B			От столба C			Вдоль линии D		
	E расчётный момент M	F испытательный момент $M_{исп}$	G предельный момент $M_{пр}$ (не менее)	H расчётный момент M	I испытательный момент $M_{исп}$	J предельный момент $M_{пр}$ (не менее)	K расчётный момент M	L испытательный момент $M_{исп}$	M предельный момент $M_{пр}$ (не менее)
a СПШ-1,25	0,22	0,32	0,42	0,2	0,22	0,3	0,2	0,22	0,3
b СПШ-1,3	0,45	0,5	0,68	0,2	0,22	0,3	0,32	0,35	0,48
c СПШ-2,75	0,65	0,72	0,85	0,3	0,33	0,45	0,45	0,49	0,65
d СПШ-4,8	0,83	0,92	1,2	0,44	0,48	0,63	0,65	0,71	0,86
e СПШ-6,3	1,09	1,2	1,5	0,5	0,66	0,87	0,91	1,08	[illegible]

[Please see key on the previous page.]

Fig. 5; the support bending moment M = Pl, hence P=M/l, or

$$P_t = \frac{M_t}{l};$$

2) for testing as illustrated in Fig. 5b: $M = Pl_1/4$, $P = 4M/l_1$, consequently,

$$P_t = \frac{4M_t}{l_1},$$

where P is given in tons and l in meters,
M is given in ton-meters.

The magnitude of the force P is determined by the weight of the suspended load or the dynamometer reading.

In bend tests on poles or supports, they must sustain for 10 min a test load M_t which exceeds the design load by 1.1 times (by 10%).

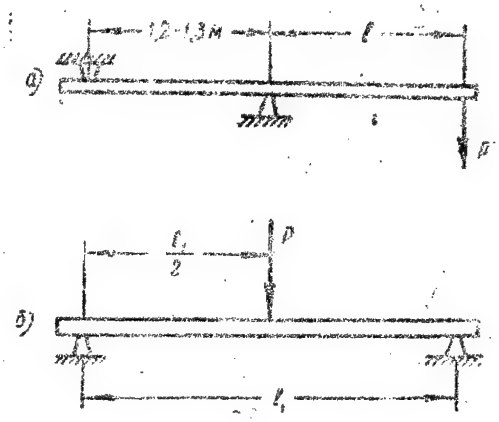


Fig. 5

Poles and supports are considered to have withstood a bend test if after the test load has been removed there

are no remaining open cracks in the concrete of the zone subjected to tension.

Where isolated poles or supports do not withstand the bend test, these members are loaded to failure. The ultimate (breaking) load will be that load for which the reinforcing rods under tension reach the yield point or a compressed layer of concrete reaches the ultimate strength and the compressed reinforcing rods begin to bulge. The ultimate load is determined on the basis of the maximum reading of the dynamometer, when the deformation (bending) of the member and widening of the open cracks in the concrete proceed with no increase in the applied force.

Premature opening of cracks in a bent pole or support can occur not only on account of inadequate mechanical strength or bending or shifting of the reinforcing framework, or, because of weak concrete, but also where the longitudinal reinforcing rods of the frame are not straight, for the reason that they straighten out, rather than extending, when bent.

The fractured specimens clarify the causes for their lack of strength, and also the correctness of the distribution of the reinforcing frames over the cross section of

the pole or support.

Where a lot of poles or supports is rejected by the customer because the pieces selected for inspection did not yield satisfactory results when their external dimensions or strength in bending were tested, the manufacturer can check the entire rejected lot, piece by piece, unacceptable for the characteristic, and after picking out the unfit parts, resubmit the lot to the customer for acceptance along with a record of the selective tests used on the rejected lot.

The customer for reinforced concrete poles and supports should retain the documents obtained from the manufacturer, pertaining to the product, for a considerable length of time, and should prepare an account of the installation, operation, and repairs to each lot of reinforced concrete poles or supports.

E. L. Poverennyy, engineer, Central Communications Scientific Research Institute (TsNIIS)

EXPERIENCE IN OPERATING WIRE-BROADCAST CENTERS USING KRU-2 and KRU-10 EQUIPMENT

When wire broadcasting was extended to lumbering enterprise settlements and other small popu-

lated areas in the Krasnoyarsk kray, far removed from the large wire-broadcast centers, many wire-broadcast centers were constructed using KRU-2 and KRU-10 equipment.

The upkeep of these centers, which serve a small number of loudspeaker stations, represented a loss, since to provide normal service for 10.5 hours per day a staff of not less than two supervisors was provided for.

In view of this, the Krasnoyarsk communications administration, after careful study of local conditions and resources and extensive preparatory work, and after obtaining the consent of the ministry of communications of the Russian Socialist Federative Soviet Republic (RSFSR), in July of 1957 introduced trial wire-broadcast service using one basic attendant at 88 centers. KRU-10 and KRU-2 equipment was used, having subscriber-line plants of up to 10 km each in the primary service areas of long- or medium-wave radio stations. In order to carry out the work involved in servicing the subscriber-line plant, the power sources, and the battery chargers, the wire-broadcast-center technician was permitted to leave the turned-on equipment of the center alone during the period of unattended operation.

Working days and rest periods of normal length are provided for the main worker at the center by enlisting

an additional worker to help him, chiefly from among the members of his family. A special schedule was established for the working day of the chief employee, according to which he served at the wire-broadcast center on the basis of the following timetable: from 6 to 6:15, turn on the center; from 8:15 to 10:15, line work (fix damage, routine repairs); 10:15 to 11, check the operation of the wire-broadcast system, turn it off, write up the log, and carry out preventive inspection of the equipment; from 11 to 1, charge the batteries, and from 2 to 5, line and subscriber work, after which switch on the center. With this, the working day of the chief employee is ended. The extra worker shuts down the center at midnight.

In establishing this schedule, the Krasnoyarsk communications administration permitted no infringement of the existing working conditions of the communications workers with respect to hours of work and rest, since the number of breaks in the work of the chief employee do not exceed two, and the total duration of the breaks amounts to no more than three hours.

The extra worker turns the wire-broadcast center on and off on the chief employee's days off. The former is paid in accordance with the labor agreement an amount not exceeding one days rate of pay for a supervisor second class

per week. During the usual vacation period of the chief employee, he will be replaced by another technically trained worker sent out from the rayon communications bureau. The time-consuming work of line repair (replacing poles, conductors) is done either by workers engaged locally, thier labor being charged against specially allotted funds, or by workers from the bureau, who are attached to the center for the time required for the repairs.

To decide a question of converting a given wire-broadcast center to one-man operation, the Krasnoyarsk communications administration sends a specialist to the locality. He carefully checks the possibility of reliable reception of long-and medium-wave stations by listening directly to their transmissions, as well as by interviews with the workers at the center, and with radio-receiver owners, and by analyzing the equipment log. Moreover, he converts the equipment to fixed tuning, eliminating the possibility of receiver drift. After this, he organizes the study of the instructions for the one-man servicing procedure for the KRU-10, KRU-2 wire-rebroadcast center systems by both the chief and the part-time employees; the procedure was developed by the Krasnoyarsk communications administration. The extra worker must have a good knowledge of the procedure for turning the center

on and off, and the basic rules for safety. The test on the knowledge of the instructions is formally written. After this he concludes an agreement with the extra worker.

Authorization to service a wire-rebroadcast center with one chief worker is issued by the rayon communications administation bureau only after receipt of the document confirming that the preparations discussed have been carried out.

The conversion of 88 centers to the new sevice procedure permitted the Krasnoyarsk communications administration to release 88 staff personnel at the centers with an annual payroll of 430,000 rubles.

Attaching great importance to this action, the main administration for radio-service extension and intrarayon electrical communications of the Ministry of communications of the RSFSR decided to study the experience of the Krasnoyarsk communications people. Familiarization with the operation of the wire-rebroadcast centers in the settlements of Soldatovo, Posol'noye, Sliznevo, Shapkino, Kedrobyy Log, Abalakovo, and Teplyy Klyuch showed that the decrease in the rebroadcast-center staff did not impair the physical state of the center's plant or the quality of service to the subscribers. The opinions of the party and social organizations and the population as to

the operation of the wire rebroadcast centers investigated were favorable, and no complaints were received.

Thus, at the center in the settlement of Abalakovo in the Yenisey rayon, technician Tugovikov serves 96 loudspeaker stations, located in two populated areas 7 kilometers apart. The line runs 10 kilometers altogether. At the time of the inspection, the equipment and subscriberline plant of this rebroadcast center, serviced by one chief employee, were in good condition. Comrade Tugovikov fulfilled the development plan (30 loudspeaker stations) completely and on time, as was true for the routine repairs. There was no down time at the center, and the broadcasts were of good quality.

Despite the number of faults disclosed by the check on the centers which were caused by organizational shortcomings and in many cases by a lack of supervision on the part of the (DRTS) Radio rebroadcasting net management the investigation showed that it is completely possible for one chief employee to service a small radio rebroadcast center.

The proposed system for servicing centers with KRU-10 and KRU-2 equipment leads to the release of large number of staff personnel; in the RSFSR, according to a preliminary calculation, the system could be installed at 400 centers, at an annual savings in operating expenses of

about 2,000,000 rubles. The administration for local telephone communications and wire rebroadcasting extensions of the Ministry of Communications of the USSR should hasten its decision on the question of the extension of the experience of the Krasnoyarsk communications administration to rural wire rebroadcasting centers of other oblasts, krays, and republics.

T. G. Ivanova, senior engineer, Main administration for wire rebroadcast extension and intra-rayon electrical communications of the Ministry of communications of the USSR

N. V. Formin, Chief of the Krasnoyarsk kray radio rebroadcasting net management

EXPERIENCE IN TEACHING SERVICING TECHNIQUES FOR INTRARAYON AUTOMATIC TELEPHONE SYSTEMS

The introduction of automatic and semi-automatic equipment on the lines of intrarayon telephone service (VRS) facilities has made it necessary to organize instruction of radio technicians for servicing the new office equipment. The fact is, that as rayon automatic exchanges (ATS VRS) UPTS,* and VChR* came into service, signs of unsatisfactory telephone service began to appear. This

*Abbreviations available.

was caused by the fact that the service personnel did not know the devices or the directions for operating them.

The management of the radio rebroadcasting net conducted two-month courses on the automatic and semi-automatic facilities, their equipment, and their servicing. But this did not help much to achieve competent technical operation. Therefore, the DPTS (radio rebroadcasting net management) encouraged the initiative of Ye. I. Cheremukhin, an installation man in our SMUR (construction and installation administration for rebroadcast system extension) who proposed that the instruction of the service personnel take place at the time the ATS VRS's are installed.

Comrade Cheremukhin has more than 25 years of production experience. In 1956, working in the construction and installation administration for rebroadcast net extension, as a travelling technician installing wire rebroadcasting centers and ATS VRS's, he assembled more than 40 rebroadcasting centers, 20 ATS VRS systems of varying capacities, a group of RDP (abbreviation not available), and power plants in kolkhoses, sovkhozes, worker's settlements, and in cities of the oblast.

In the documents accepting for service rebroadcast centers assembled by Comrade Cheremukhin, the high quality

of the installation has been noted, whether of a kokhoz installation with TU-600 equipment or of an urban installation using TU-5 equipment. Moreover, whatever the job, he always meets the deadline.

In the middle of last year, it became necessary to bring a considerable number of ATC BRS's into service. The SMUR did not have installation personnel for this job. Comrade Cheremukhin, knowing the basic circuit of the ATS BRS, rather quickly mastered the installation of these exchanges, and by the end of the year had brought into operation eight ATS VRS's of various capacities.

While assembling wire rebroadcasting centers and telephone exchanges, Comrade Cheremukhin supervised technicians and supervisors from the rayon communications bureaus. In doing this, the installation work often turned into an educational process, since while the parts and units were being mounted, he discussed the operating principles and servicing procedures for the equipment.

Soon afterward, however, it turned out that this was not sufficient to acquaint the communications men of the rayon bureau with the new equipment, especially the automatic installation. It was then that it occurred to Comrade Cheremukhin to instruct the technicians and supervisors of the rayon communications bureau in

practical servicing skills for the ATS VRS and other equipment while the installation was being made. He made up his mind to raise their general technical level, familiarize them with the operation of the ATS VRS, with the construction and operation of the lines and associated equipment and of the subscriber points, to analyze the damage most frequently occurring at the subscriber points, to the network, in the office installation, to discuss increasing protection, etc.

It all began in the village of Severo-Konevo in the Nev&yansk oblast, where Comrade Cheremukhin had arrived to install an ATS VRS. The workers from the communications bureau -- line technicians, rebroadcasting center technicians, district supervisors, and two line supervisors all very eagerly agreed to serious study of the arrangement and servicing of the ATS VRS, and Comrade Cheremukhin conducted lessons for them on the following topics.

1) Office power supply. Detailed consideration was given to the power-supply circuits, the conductors used for the wiring, charge-discharge devices, etc., after which all of the power-supply devices were demonstrated.

2) Types of batteries, battery layouts, principles of operation and methods of servicing.

3) Simplified schematics of various types of ATS VRS's, their interconnection and operations.

4) Switching in the ATS VRS and at the entrance frame.

5) Comparison of telephone devices and their operation. Signal transmission by inductive interaction in the ATS VRS system, and the advantages of this method.

6) Subscriber-point equipment, its protection

7) Common defects and their elimination.

The lessons were conducted in this manner. In their notebooks, the students wrote out the technical data for the equipment and drew the circuits. After this, Cheremukhin examined the layout and circuit of the equipment in detail, clarifying questions not completely understood.

Then, in order to reinforce the knowledge gained, the students themselves took part in the discussion. Finally instruction in the topics took the form of illustration and practical analysis of actual equipment. Defects were created artificially, without disturbing the circuits and wiring; the students sought out and corrected these faults on their own. Two to three hours were spent on each topic. The eighth and final lesson served to summarize. Cheremukhin posed questions on all the topics, and either accepted the answer or gave an additional detailed explanation.

Now there are no complaints from the Nev'yansj rayon about faulty equipment.

In the same way, Comrade Cheremukhin trained four workers in the Berezobskiy rayon and two in the Polevskoy rayon for independent servicing of ATS VRS equipment. The method for instructing the workers of rayon communications bureaus in technically competent servicing of new/VRS and wire rebroadcasting equipment, which was developed by Comrade Cheremukhin, supplements the steps taken by the DRTS to raise the technical level of the communications men of the rayon bureaus.

A. G. Yezhov, Senior engineer, standards research group, Sverdlovsk radio rebroadcasting net management

INFORMATION

LEADERS IN SOCIALIST COMPETITION

Soviet communications workers, together with all workingmen in our country, have actively joined in socialist competition for the completion of the Seven-year plan ahead of schedule; this competition also extends to the second year of the plan, to increasing labor productivity, improving the quality of work, maximum utilization of resources, and to technical progress in the communications operations.

Better than 90% of the communications workers of the Soviet Union are taking part in this competition. More than 3,500 collectives are striving for the honor of the title of "Brigade of Communist Labor," and more than 10,000 individual communications workers are competing for the title of "Shock-worker of Communist Labor."

The increased socialist competition prior to May contributed in great measure to the successful fulfillment of the basic work indicators for the communications organs during the first quarter of 1960. The income plan for the entire union was exceeded by 0.4%.

Thirteen republics fulfilled the income plan of the Ministry of Communications: RSFSR, UkSSR, BSSR, Uzbek, Kazakh, Azerbaydzhan, Lithuanian, Latvian, Kirgiz, Tadzhik, Armenian, Turkmen, and Estonian union republics.

The majority of the communications enterprises which are directly under the USSR Ministry of Communications successfully fulfilled the income plan. Throughout the Soviet Union, on the whole, the plan for increasing the number of urban telephone subscribers was overfulfilled; this was also true of the plan for the distribution of printed matter. During the first quarter of this year, relative to the corresponding period of a year ago, a number of work quality indicators have been improved. The percentage of telegrams delayed in transmission and delivery has been reduced, as has the percentage of wasted effort in the processing of telegrams during transmission; reductions were also achieved in the time that the transmission lines were not in actual use in the oblast, kray, and republic centers, in the duration of idle time at the radio-relay centers, and in the quantity of undelivered mail. The number of uncompleted long-distance connections was reduced, as was the number of connections that required more than one hour to complete the call; there was a re-

duction in the average number of urban telephone network breakdowns, in the average duration of the breakdown on interurban telephone-telegraph link and in the urban telephone networks; further there was a reduction in the number and in the total ruble amounts of mail that was either stolen or lost.

* *
*

On the basis of the results of the socialist competition among the collectives of the enterprises and construction organizations of the Soviet Union, 32 collectives were presented to the branches of the departments of the Ministry as candidates for the top spot in this competition.

The Board of Ministers of Communications for the USSR and the presidium of the Central Committee of the trade union of communications, automotive, and highway workers, on examining the results of the competition, awarded transferrable Red Banners (challenge banners) and prizes to the wimners.

The workers' collectives of the Central Telegraph Office of the USSR (Supervisor, Comrade Guzovskiy),

chairman of the local committee, Comrade Vanochkin) and of the Akhtyr factory of the UPP (Management of Mail Transportation (Supervisor, Comrade Gafanovich, chairman of the factory committee, Comrade Popov) kept for a second year the transferable Red Banners of the Council of Ministers of the USSR and the VTsSPS which they had been awarded earlier; in addition they received first prizes.

The collective of the management of the construction trust No. 305 "Radioconstruction" (Supervisor, Comrade Kuchukov, chairman of the local committee, Comrade Khrulyev) kept, for a second year, the transferable Red Banners of the USSR Ministry of Communications and of the CC of the Trade Union; in addition, the collective was awarded first prize.

Second prizes were awarded to the collectives of the Central Interurban Telephone Exchange (Supervisor, Comrade Nikul, chairman of the local committee, Comrade Babina) and to the Central Retail Office "Soyuzpechat" (Supervisor, Comrade Volodin, chairman of the local committee, Comrade Filippov).

Third prizes were awarded to the collectives of television studio No. 10 in Kiev (Director, Comrade Zakharov, chairman of the local committee, Comrade Skuratovskiy) and to the collectives of the manage-

ment of the construction trust No. 3 "Moscow Telephone Construction" (supervisor, Comrade Pinskiy, chairman of the local committee, Comrade Blinov).

Improvements were also noted in the work of a number of other communications-enterprise collectives. In addition, it was pointed out that a number of enterprises had not fulfilled their assigned tasks. Among the lagging enterprises, with low qualitative indices, we find: the management of the cable and radiorelay trunk links, where Comrade Samoylov is supervisor, the Ussuriyskiy radio center (supervisor, Comrade Suvorov), the UPP factory, where Comrade Voronov is supervisor, the UPP factory, where Comrade Govorov is supervisor, the management of construction trust No. 162 "Radioconstruction" (supervisor, Comrade Stoylov), the Novosibirsk construction trust "Union Telephone Construction " (Supervisor, Comrade Kamnev), and others.

* *

*

The collegium of communications ministers and the presidia of the trade — union committees of the union republics recognized the following collectives as the

winners of the competition.

RSFSR

The workers' collectives of the Ivanov oblast (supervisor, Comrade Nefedov, chairman of the regional committee of the trade union, Comrade Smirnov), and of the Moscow radio-relay network (supervisor in charge, Comrade Asoyan, chairman of the local committee, Comrade Gol'dberg), were awarded the transferable Red Banners of the RSFSR Council of Ministers and the VTsSPS and first prizes.

The collectives of the Leningrad Post Office (supervisor, Comrade Korneyev, chairman of the local committee, Comrade Antipin) of the Novosibirk Telegraph Office (supervisor, Comrade Bratukhin, chairman of the local committee, Comrade Timofeyeva) of the Moscow Urban Telephone Network (supervisor, Comrade Pominov, chairman of the local committee, Comrade Vershinskiy), of the Bashkir radio center(supervisor, Comrade Sokolov, chairman of the local committee, Comrade Shafikov), were awarded the transferable Red Banners of the RSFSR Council of Ministers and of the Central Committee of the Trade Union; they also received first prizes.

Second prizes were awarded to the collectives of the Kazan Mail Delivery Department (supervisor, Comrade Belous, chairman of the local committee, Comrade Onokhina), of the Transportation Communications Office of Komsomolsk (supervisor, Comrade Bogoyavlenskiy, chairman of the local committee, Comrade Summarokov), of the Sverdlovsk MTS (Interurban Telephone Office)(supervisor, Comrade Klebanov, chairman of the local committee, Comrade Lugovets), of the Dzerzhinsk Branch of the Gor'kiy Oblast Radio Center (supervisor, Comrade Endalov, chairman of the local committee, Comrade Mezinov).

Third prizes were awarded to the communications workers' collectives of the Kaliningrad Oblast (managing supervisor, Comrade Vinogradov, chairman of the regional committee of the trade union, Comrade Potapov), of the Tushinsk Main Communications Office of the Moscow Oblast (supervisor, Comrade Dikikh, chairman of the local committee, Comrade Bukreyeva), of the Orenburg Telegraph and Telephone Office (supervisor, Comrade Veregovskiy, chairman of the local committee, Comrade Bronskiy), of the Skovorodinsk LTU(*) of the Amur Oblast (supervisor, Comrade Mikhaylik, chairman of the local committe,

(*) Translator's note: Initials not identified in standard sources.

Comrade Voronina), of the Sverdlovsk City Telephone Network (supervisor, Comrade Shusharov, chairman of the local committee, Comrade Belousova), and of the Kirov SMUR(*) (supervisor, Comrade Plyusnin, chairman of the local committee, Comrade Siyalov).

BELORUSSIAN SSR

The transferable Red Banners of the Ministry of Communications and the Central Committee of the Trade Union, and the first prize, were awarded to the workers' collective of the Minsk MTS (supervisor, Comrade Gudzovskiy, chairman of the local committee, Comrade Sverchkova).

The second prize was awarded to the workers' collective of the Gomel Mail Delivery Department (supervisor, Comrade Novikov, chairman of the local committee, Comrade Davydov).

(*) Translator's note: Initials not identified in standard references. Probably "Rayon Construction Administration."

LATVIAN SSR

The first prize and the transferable Red Banner of the Council of Ministers of the Latvian SSR and of the Trade-Union Council of the Republic were awarded to the communications workers' collective of the Latvian Republic Radio Center (supervisor, Comrade Kholin, chairman of the local committee, Comrade Babkin); a first prize and the transferrable Red Banners of the Ministry of Communications for the Latvian SSR and of the Trade-Union Committee of the Republic were awarded to the the communications workers' collective of the Gulbensk Rayon (supervisor, Comrade Tsvetkov, chairman of the local committee, Comrade Gaspazhenya).

Second prizes were awarded to the workers collectives of the Valmiersk LTU (supervisor, Comrade Gur'yanov, chairman of the local committee, Comrade Valtenber), of the Ventspilsk Communications Office (supervisor, Comrade Rauman, chairman of the local committee, Comrade Shtenberg and), of the Ventspilsk Line Section (supervisor, Comrade Gegeris).

The third prize was awarded to the workers' collective of the Transportation [illegible] Office of

the Latvian SSR Ministry of Communications (office supervisor, Comrade Antonenkov, chairman of the local committee, Comrade Melnalksnis).

MOLDAVIAN SSR

The first prize and the transferrable Red Banner of the Ministry of Communications of the Moldavian SSR and of the Trade-Union Committee of the Republic were awarded to the workers' collective of the Bel'tsk Rayon Communications Office (supervisor, Comrade Roshchin, chairman of the local committee, Comrade Fodar').

The second and third prizes were awarded to the workers' collectives of the Kishinyev Mail Delivery Department (supervisor, Comrade Grigorashenko, chairman of the local committee, Comrade Khranovskaya), of the Kishinyev LTU (supervisor, Comrade Lyublinskiy, chairman of the local committee, Comrade Muntyan), of the Kishinyev City Radio Center (supervisor of the DRTS(*), Comrade Garash, chairman of the local committee, Comrade Gushchin), and of the Faleshtsk Rayon Communications Office (supervisor, Comrade Kyrlan, chariman of the local committee,

(*) Translator's note: Initials not identified in standard sources.

Comrade Fidel').

* *

*

The improvement in the work of many other collectives of communications workers was also noted by all the Ministries of Communications and by all the Trade-Union Committees.

MONTHLY SAFETY INSPECTION

The communications enterprises of the Moldavian SSR recently underwent a month-long public inspection of their industrial hygiene and safety facilities and techniques. Through this inspection a considerable improvement in the working conditions for the communications workers was achieved.

Thus, for example, the Kishinev City Radio Center of the Radio Retransmission Network, during this period, inspected the condition of the support poles, and checked the amount of space left between the wires at those points where the rural radio lines approach or intersect /the contact network lines or the power lines in Kishinev. At this time, the inspectors and workers of the line teams (brigades) removed 64 dangerous stretches of line. Records were kept of rotted poles, and all inspectors had been cautioned to be particularly careful while working at these poles. A plan was developed for the elimination of dangerous stretches of line as they are detected.

The workers of the communications office of the Dubossarsk Rayon checked the poles of the Intra-rayon Tel-

ephone Link, of the Urban Telephone Network, and of the rural radio lines. Together with the management of the power-supply network, the inspectors undertook measures which were designed to eliminate dangerous stretches of line at the points where communications and power lines intersect; at the same time, during this inspection, five crossings were converted to meet technical standards. The lighting of the telegraph office was improved, and an adequate quantity of pole hooks and beam holders were produced for work along the lines.

In the Bendersk Rayon Communications Office a great number of the most active communications workers took part in the monthly inspection. Production meetings were held in the various departments, and general meetings of all the workers of the communications office were also held. In addition to the preparation of the plan to eliminate dangerous stretches of line along the Urban Telephone Network, the Intra-Rayon Telephone Network, and the rural radio lines, repair ladders were also put in shape, and the dielectric insulators were also checked.

In the Tiraspol'skiy Communications Office, during the inspection, the lighting of the work stations in the operations hall was improved, the conveyor belt in the mail-delivery department was repaired,

the ventilation system was put in order, and the dielectric insulators were checked.

Special plans were devised at the republic radio centers, at the Kishinev City Telephone Network, and at other enterprises, in order to eliminate the technical shortcomings with respect to safety that were disclosed in the course of the inspection.

In carrying out the inspection, the workers of the ministries and the technicians and mechanics of the DRTS (Long-distance Manual Telephone Exchange) inspected the safety techniques and conditions of industrial hygiene at 15 Rayon offices of communications. In most of the offices the situation with regard to labor safety was pronounced satisfactory.

However, some communications enterprise managers and chairmen of local committees were not very thorough in the inspections which they carried out: they limited their inspection to the disclosure of shortcomings, whereas they should have undertaken steps to create safe and healthy working conditions.

The Collegium of the Ministries of Communications of the Moldavian SSR and the Presidium of the Republic Trade-Union Committee, reviewing the work of the inspection, drew the attention of the supervisors of the com-

munications enterprises and of the chairmen of the local trade-union committees to the fact that the maintenance of the norms and the observation of the rules of safety, the protection of labor, and industrial hygiene was one of the most important tasks at the communications enterprises. The supervisors of the enterprises, regional offices, and the chairmen of the local trade-union committees were advised to organize special sessions for line inspectors, prior to the start of repair operations, at which sessions they would study the practical aspects of safe operating methods.

The managers of branch departments, of the DRTS, of the department for labor and wages, and the chiefs of the ministries of communications in the republic must keep a constant check on the manner in which the safety rules are complied with at working places, and they must assist the enterprises in putting the indicated measures into effect.

The supervisor of the Republic DRTS was advised to strengthen his control over the ventilation installations at the power plants and to equip all power plants with such installations, wherever they do not yet exist.

CONVERTING TELEGRAPH LINKS FOR AN AUTOMATIC DIRECT-CONNECTION SYSTEM

The Ministry of communications of the Lithuanian republic has decided to convert its telegraph links to an automatic direct-connection system in the current year. In the first place, by the first of July of this year, wiring and adjustment of ATA [abbreviation not available; probably stands for 'subscriber telegraph apparatus'] APS (automatic direct connection) offices will have been carried out in such cities as Vil'nyus, Kaunas, Klaypeda, Panevezhis, and Shyaulyay. Type ATA-M stations have been installed in 29 rayons of the republic by the personnel of the line-communications engineering centers; they will be placed in service in the last quarter of this year. In addition, the possibility of equipping 14 more ATA-M station is being studied. In order to decrease the busy time of station instruments and channels "self-service" and automatic answering devices are connected into the terminal-point equipment in the APS network.

The technical administration of the ministry of communications of the republic, together with the Vil'nyus central telegraph and international telephone office, has developed a circuit for interconnection of

ATA APS and ATA-M stations.

The ministry of communications of the republic has taken measures toward the maximum development of subscriber telegraph in order to complete the transfer of the basic part of the telegraph volume from the enterprises of the sovnarkhoz (Council of the National Economy) of the Lithuanian SSR from the public circuits to the AT [subscriber telegraph, teletype, etc.] circuit, in the shortest possible time. A telegraph communications center installation is planned for the central hall of the sovnarkhoz. Before long, a course will be set up to train technicians to service ATA APS and ATA.

NIKOLAY NIKOLAYEVICH LUZhETsKIY *

On April 29, 1960, after a prolonged and serious illness, Nikolay Nikolayevich Luzhetskiy, chief editor of the journal "Herald of Communications," passed away.

N. N. Luzhetskiy was born in 1906 in the town of Orel. Having entered the ranks of communications men as a youth of fifteen, he progressed from telegraph operator to senior engineer of the Miusk telephone center of Moscow.

In 1946, Nikolay Nikolayevich was transferred to the editorial department of the journal "Herald of Communications," where he took charge of the section dealing with wire communications. Being an extremely conscientious worker, he applied his great knowlege and skill to the discussion of various problems related to the development and utilization of electronic communications. N. N. Luzhetskiy is widely known as the author of books, brochures, and magazine articles dealing with problems of wire communications.

The work of comrade Luzhetskiy has been rewarded with some government decorations -- the order of the "Badge of Honor," three medals, the badges of " Otlichik

* deceased.

sotsialisticheskogo sorevnovaniya Ministerstva svyazi SSSR" (for excellence the socialist competition of the USSR Ministry of Communications), and the "Pochetnyy znak Mossoveta" (Medal of Honor of the Moscow Soviet), and a number of mentions and prizes.

The collective of the Svyaz'izdat (State Publishing House of Literature on Communications and Radio Problems) and of the journal "Herald of Communications" are deeply grieved by the untimely death of N. N. Luzhetskiy, a sensitive comrade, a man of great culture, who, over the years, gave to his difficult work much creative power, energy, and initiative for the good of our Motherland.

A group of comrades.

DO NOT FORGET TO RENEW YOUR
SUBSCRIPTION TO THE JOURNAL
FOR THE SECOND HALF OF 1960

SUBSCRIPTIONS ARE ACCEPTED without limitations by the city departments of the Soyuzpechat (Central Administration for the Distribution of Printed Matter), in all its offices, Communications Departments, and the subscription agents at the enterprises and institutions

Herald of
COMMUNICATIONS

2	HIGH-QUALITY PRODUCTS BY JOBLING- British manufacturer of the heat resistant thermostable "pyrex" glass --for radio broadcasting, television, and electronic instruments.truments
1 MULTIFORM PRODUCTS for the mass production of glass insulated metals	In the manufacturing process of the glass MULTIFORM, small glass particles are pressed into the required shape and are fused at high temperature in order to create a vacuum-proof structure. The use of this method makes possible the low-cost mass production of glass parts with complex shapes, multiple openings, and small radii, with an accuracy of 0,0762 mm. Careful control of the whole manufacturing process ensures uniform density and irreproachable quality of all products. MULTIFORM products are manufactured from glass having the same coefficient of expansion as the following metals:

	molybdenum, copper, platinum, the alloy "Kovar" (Fernico) and platinite. MULTIFORM products are now in use for diode casings, transistor bases, electronic-gun bases--would you like to order from Jobling those Multiform products with are required to fill your needs?
2 RHEOSTATS WHICH ARE COVERED WITH A FILM OF METALLIC OXIDE These rheostats by Jobling are manufactured from rods of heat resistant "pyrex" glass which are covered with a film of	HIGH-STABILITY RHEOSTATS OF TYPE N Accuracy--manufacturing tolerances to 1%. Rheostats with tolerances of 2% and 5% are also available. Power 0.5, 1 and 2 watts. Stability--the mean value of the change in resistance after 2000 hours of operation at 70°C, with a direct current voltages calculated in accordance with the rated resistance, and rated power for a given temperature, is less than $\pm$ 0.25%. Low noise level--to a great degree independent of frequency. A low voltage

metallic oxide. Screw threads are cut in the film and it is then covered with moisture-proof lacquer.	factor 1 and low inductive and capacitive reactance. P TYPE RHEOSTATS--built specially for radio broadcasting, television, and other equipment, but because of their outstanding operational characteristics under adverse conditions they are ideally suited for use in many other fields. Accessibility*-- accessibility* for standard manufacture ± 5%. Four models are being produced with powers of 3, 4, 5, and 7 watts. Temperature coefficients--the value of the temperature coefficient between 20° and 70°C is within the range from 0 to 350 ppm (millionths parts per 1°C). The usual temperature coefficent is -200 millionths parts per 1°C. Overload--an overload of ten times the normal load for a duration of five seconds will change the resistance by 0.5%.

*Translator's note: This seems to be a misprint for "dopusk", tolerance.

Inquiries in Russian may be addressed to:

ELECTRICAL SALES DEPARTMENT JAMES A. JOBLING & CO. LTD.

Wear Glass Works, Sunderland, England.

MACHINES FOR DAYLIGHT

FILM DEVELOPING

"THE LAWLEY JUNIOR"

May be used for

* The developing of television news films
* The production of industrial films
* Reprinting of microfilmss
* Scientific and industrial analysis
* Educational purposes, etc.

"THE LAWLEY JUNIOR"

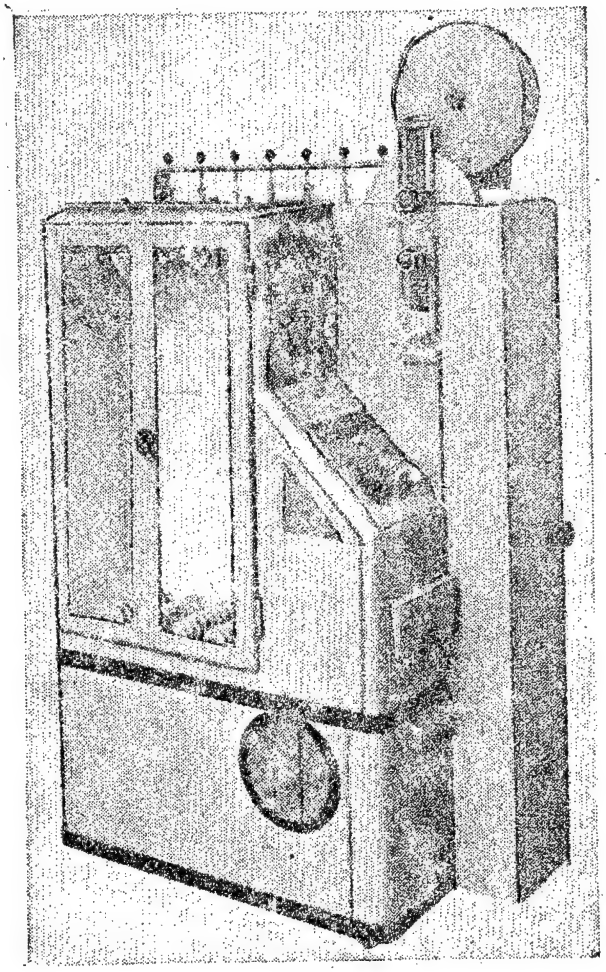
* Operates in daylight
* The temperature of the solution is controlled within $\pm 0.27^{\circ}$
* Dimensions--length 109 cm; width 75 cm; height 186 cm
* Weight of the machine itself, 385 kg; with the solutions, 476 kg
* Total electric power drawn 7 kilowatts
* Productivity of the two-dimensional type as much as 13 meters per minute; of the 16-mm high speed

type as much as 26 meters per minute

These machines are being used by all the television companies of Great Britain, and also in other countries

NEWMAN & GUARDIA LTD.

Temple Fields, Harlow, Essex, England



MEASURES TO 1 MICROMICROFARAD AT THE END OF A FLEXIBLE CABLE OF ANY LENGTH

The possibility of accurate remote measurement widens the field of application of this bridge.

The General-Purpose Bridge, B221, may be used in industry for different measurements. The components of complex impedances may be measured with an accuracy of ± 0.25% without disconnecting them from the circuit. An additional convenience is the possibility of taking measurements at two, three, or four terminals.

This instrument makes it possible to determine component and circuit characteristics; with the aid of special attachments we can measure the conductance of liquids, the dielectric constants of solid bodies and liquids, poorly-soldered connections, the resistance at the contacts of cut-off switches, the resistance of layers of liquids, the specific inductive capacitance and loss factor of solid bodies and liquids and the dielectric properties of liquids in test tubes.

The scales have a simple system of direct readings.

The General-Purpose Bridge, B221, is equipped with ith

specially designed indicators and controls. A new type of mechanism automatically shows in the dial window the measurements in units and tenths. As a result, the errors which may arise in the case of high coefficients are eliminated. This very simple method of reading makes it possible for nonqualified workers to use these instruments. A complete description of the instrument and its fields of application is found in the Information Bulletin RB 221, copies of which will be sent on request.

SPECIFICATIONS

Capacitance	0.0002 pF to 11 μF
Accuracy	$\pm$ 0.25% $\pm$ 0.0002 pF
Conductance	10^{-1} to 10^{-8} mhos (10 to 100 M)
Accuracy	$\pm$ 0.25% $\pm$ 0.00002 umho
Inductance	1 mH to infinity
Accuracy	$\pm$ 2% $\pm$ 1 mH

EXPANDED RANGE WITH THE USE OF A LOW IMPEDANCE ADAPTER:

Capacitance	1 μF to 100,000 μF
Resistance	50 u to 100 [sic]

Inductance	5 muH to 10 mh
Frequency Measurement	10,000 cps
Feed Network	100/125 v, 200/250 v, 40/60 cps
Dimensions in inches	17" x 7" x 11.5"
Weight	25 pounds (appr.)

The Wayne Kerr Laboratories Limited,
44 Coombe Road,
New Malden, Surrey, England

The Wayne Kerr Universal Bridge
type B221

THE SVERDLOVSK TECHNICAL SCHOOL OF ELECTRONIC COMMUNICATIONS IS THIRTY YEARS OLD

Thirty years ago, on the decision of the People's Commissariat for Post and Telegraph Offices, the second (after Moscow) technical school of electronic communications in the country was established. Since that time 3,678 postal, telephone-and-telegraph, and radio-communications specialists were graduated from this school. In 1930, only 90 students were studying in three class groups. Today, 517 persons in 18 groups are mastering five different specialties.

The further development and improvement of communications facilities would be impossible without an increase in the general educational and technical level of the workers. This is why the communications workers are seeking and striving to complete and expand their theoretical training. The correspondence and evening sections of the Sverdlovsk Technical School have, over the past eight years, awarded 270 diplomas, while these working students continued at their jobs without interruption. Many of the earlier graduates of the school have become industrial leaders.

The school has also trained a number of instructors. M. Kh. Mukhamedzyan, a shy young man from a distant Tartar village came to the school in 1930; he is now the chairman of the radio department and the secretary of the party organization. Since 1935, I. I. Iofin has been working at the school, rising from student to director N. Ye. Alekseyevna has now been passing her knowledge, in her capacity as instructor in chemistry, to the students. The graduates of the school gratefully remember the instructors who have now retired-- N. V. Sakovskaya, F. Ye. Yegorova, N. A. Smorgun, and K. V. Sorokina, each of whom has given 27 to 28 years to their work.

A younger generation of instructors has taken their place-- Ye. A. Konovalov, F. I. Vaysbrud, and others.

The scholastic program of the school is geared to the law "On the strengthening of the relationships between schools and life and on the further development of the national education system in the USSR." The students at the school have access to ten laboratories which are equipped with the actual devices and instruments used in the various forms of communications. Most of the students' work is carried out in these laboratories. All post-graduate projects are closely related to actual production.

The student body is constantly growing. In 1961, therefore, school will undertake the construction of a new building. This building will house the classrooms and laboratories and provide dormitory space for 850 students.

A MIXED TEAM (BRIGADE) OF RATIONALIZERS

The rationalization operation is in full swing at the Leningrad Telegraph Office.

The photograph shows (from left to right): a mixed team of production rationalizers consisting of laboratory engineer A. V. Pavlov, laboratory supervisor G. A. Shchekin, the supervisor of the trunk-line communications service, Ye. M. Drukker, and assistant shift foreman A. D. Gerkulesov.

This team (brigade) has developed a method of transmitting telegrams over trunk lines without printed monitoring, and this method is now used in Leningrad and in many other telegraph offices throughout the country.

NEW BOOKS FROM THE

COMMUNICATIONS

PRESS

Released and on sale

Shamshur, V. I. Lenin and the Development of Radio. (In commemoration of the 90th birthday of Vladimir Il'ich Lenin), 1960, 194 pages, plus two colored inserts. Price: Leather binding--6 rubles.

Remez, G. A. Radio Measurements. (Textbook for technical schools). Second Edition, revised, 1960, 320 pages, Price: Hard Cover--7.80 rubles.

Averbukh, S. Kh., Kneller, I. A., Krukovets, F. I. Industrial TVI and Methods for its Suppression. 1960, 68 pages, Price: 2 rubles.

Farber, Yu. D. Measuring and Adjusting Multichannel Systems for Multiplexing Symmetrical Cable links. 1960, 240 pages, Price: Hard Cover--8.80 rubles.

Polyak, M. U., Yegorov, K. P. et al. The KRR-30/60 Multi-Channel Short-range System for Telephone Communications. 1960, 32 pages, Price: 90 kopeks.

IN PRINT AND SOON TO BE

RELEASED

Markhay, Ye. V., Karkevich, A. D., Roginskiy, V. N. Automatic Telephony (Textbook for Higher Educational Institutions), 1960, 30 signatures; price, hard cover - 12 rubles.

Kutashov, P. D., Livshits, B. S., Opol'skaya, Ye. K. The Universal (rural and private automatic telephone exchanges) ten-step exchange with 50 to 100 numbers. A series of Articles. 1960, 9.25 signatures and 7 inserts. Price: 5.10 rubles.

Akul'shin, P. K., Yevlanov, S. N. The Theory of Electrical Communications. Part II. Circuits with Distributed Constants (a textbook for Higher Educational Institutions) 1960, 15 signatures, Price: Hard Cover--6.75 rub.

Dobrovol'skiy, G. V. Pulse Transmissions along Communications Channels. 1960, 13.5 signatures, Price: Hard Cover--8.50 rubles.

Grodnyev, I. I., Kuleshov, V. N., Sokolov, V. V. Cable Communications Lines (a textbook for Higher Educational Institutions). 1960, 31 signatures, Price: Hard Cover--11.75 rubles.

Matsnyev, K. N. The Assignment of Work in the Communications Department (the series "Lectures for workers of the RKS (Rayon Communications Office). 1960, 2 signatures,

Price: 70 kopeks.

Shamanayev, I. P. The Organization and Operation of Mobile Communications Departments (the series "Lectures for workers of the RKS"). 1960, 2 signatures; price: 701960, kopeks.

In Preparation for Press

Samoylov, V. F. Generators of saw-toothed current in Television Sets (Basic Theory and Fundamentals of Design). 1960, 10 signatures; price: 5 rubles.

Divnogortsev, G. P., Novikov, V. A., Rezvyakov, A. P. The Theory of Long-Range Communications (a textbook for technical schools). 1960, 25 signatures, Price: Hard Cover--9.75 rubles.

New Automatic power-supply Rectifiers for Wire Communications. A series of Articles. 1960, 5 signatures, Price: 2.50 rubles.

Communications Press books are sold in the stores and at the stands of Soyuzpechat'.

In Moscow, the main store handling Svyazizdat (Communications Press) books is Store No. 120 of the Moscow Book-selling Organization (Kirov Street No. 6, Tel.

B 8-92-63), in Leningrad-- the store "Military Books" (Nevskiy Prospect 20, Tel. A 5-73-09).

COD orders may be placed through the "Book-Mail" department of the Central Retail Office of "Soyuzpechat'" (Moscow, K-9, Strastnoy Boulevard, 10).

Advance orders for new Svyazizdat books are taken at all book stores.

NEW LITERATURE

Zhuravlyev, A. A. and Mazel', K. B. Transistorized DC Converters. Moscow-Leningrad, State Power Press, 1960, 80 pages (The Popular Radio Library, No. 357) Price: 1.90 rubles.

This book examines the most common transistorized DC converter circuits, examples of circuit design are given, including a number of special circuits for such converters. This pamphlet is intended for trained radio amateurs who are familiar with semiconductor devices.

Kugushev, A. M. Radioelectronnics. Moscow, State Press for Physics and Mathematics, 1959, 60 pages, Price: 90 kopeks.

This book reviews the basic scientific achievements and numerous applications of radioelectronnics. There are sections on radar, radiotelescopes, radiometers, molecular amplifiers and generators, semiconductor devices, and devices for superhigh frequencies, new types of radio tubes, electronic computers, automatic installations, etc. The book is intended for radio amateurs, and members of school school physics societies.

Color-Television Receivers (a collection of translations) Moscow-Leningrad, State Power Press, 1960, 47 pages plus 3 color inserts. (Television Abroad). Price: 2.25 rubles.

Two articles appear in translation in this collection. The first is a popular discussion of the fundamentals of color television. The second reviews recent color-television-receiver circuits, and discusses the means for the further standardization of these circuits.

Electrical Preventive Maintenance of Equipment and Channels of the B-3, B-12, and B-12-2 multiplexed systems. Moscow, Communications Press, 1960, 213 pages (USSR Ministry of Communications. The Main Administration of Interurban Telephone and Telegraph Communications). Price: 4.40 rubles.

The department in charge of preventive maitenance determines the volume, periodicity, and sequence of operations in the electrical preventive maintenance of the equipment and channels of the multiplexed B-3, B-12, and B-12-2 systems; standards are set, and methods for measuring electrical characteristics are recommended.

Solovyev, Sh. G. The Equipment on trunk and intra-regional interurban semi-automatic telephone links with one-frequency signal codes. Moscow, Communications Press, 1960, 68 pages (USSR Ministry of Communications, Technical Administration. Lectures on Communications Engineering) Price: 1.80 rubles.

This lecture discusses the characteristics, principles of operation, circuitry, construction, and dimensions of the equipment used on trun and intraregional interurban semi-autimatic telephone links with one-frequency signal codes.

Sytina, N. V. Automatic testing of Radioelectronic Equipment, A short review of the foreign literature. Moscow, "Soviet Radio Press" 1959, 95 pages, Price: 2 rub.

There is a brief discussion of foreign methods in the automatic testing of radioelectronic equipment under factory and field conditions. The book is intended for engineers and students specializing in the field of radioelectronics and in related fields, and it is also intended for a wide circle of readers interested in the problems of electrical measurements.

Telegraph Regulations. Part I. General Operation. Moscow, Communications Press, 1960, 262 pages (USSR Ministry of Communications. Main Administration of Interurban Telephone and Telegraph Communications Offices)

No charge.

The regulations cover: 1) the functions of the technical personnel of the telegraph office for properly organized technical operations on the telegraph links; 2) the operations of the technical personnel of the telegraph office during the setting up and servicing of the links, during the restoration of service on the links which were disrupted as a result of damage or preventive maintenance; 3) relations between the technical services within the telegraph office, between the technical personnel of various telegraph offices, and also between the telegraph offices and related communications enterprises.

Titchenko, M. P., and L'vov, S. G.

Accounting in internally financed Communications Enterprises. Moscow, Communications Press, 1960, 96 pages, Price: 1.98 rubles.

This book is intended for the managers, bookkeepers, and economists of communications enterprises and institutions which are now operating under the "Khozraschet" system. The book includes examples of keeping

books a various types of communications enterprises, and there is also a discussion of the methods used in preparing annual reports for the administration (ministry) of communications for all types of internally financed communications enterprises; there is also a discussion of the method for determining production costs.

Tokarev, P. D. The Operation and Repair of Television Receivers. Leningrad, Lenin Press, 1959, 192 pages, plus 1 insert, Price: 4.55 rubles.

The principles of television-image transmission are discussed; there is also a discussion tele- vision equipment, selection and installation of receivers and antennas. Particular attention is paid to problems related to the practical uses of the television receiver: the effect of various types of interference on the reception of television programs, and the methods for the elimination of all types of imperfections.

Edel'man, A. S., and Fridman, A. S. Aluminum in Cable Engineering. Moscow-Leningrad, State Power Press, 1960, 96 pages, Price: 2.90 rubles.

This book presents a generalized picture of the applications of aluminum in cable production abroad, and this discussion includes the specific production of communications cables.

Editor [illegible]

Editorial Staff: S. G. Vultskh, N. S. Glagolev, [illegible], V. Dmitrenko, L. Ya. Dobychina, N. F. Yevdokimov, V. A. Zhiganov, V. M. Konyukhova, L. A. Kopytin, M. I. Krivosheyev, N. I. Kuvshinov, A. N. Peregudov, I. P. Petrushin, A. V. Radzievskiy, M. V. Ryzhov, A. G. Smiryagin, A. N. Tyulyayev, I. A. Shamshin, S. V. Shevchenko.

Address of the Editorial Office: Moscow-Center - Chistoprudniy Boulevard, 2, Tel. B-8-13-50

Technical Editor: K. G. Markoch

Submitted to Press: 28 May 1960

Approved 6 June 60

Communications Press Printers: Moscow-Center Kirov Street No. 40,

CREATIONS of Radio Analysts and Inventors

INSTRUMENT FOR MEASURING SIGNAL-TO-NOISE RATIO

This instrument designed to measure the ratio of the maximum signal value to the quasi-peak maximum noise amplitude under normal television system operating conditions. In carrying out the measurements, the possibility of allowing for the peculiarities of visual perception of fluctuating noise has been provided for.

The instrument was made by Senior Engineer Yu. B. Gruzdev and M. S. Syscyeva of the Moscow Television Center laboratory, with the assistance of Candidate in Technical Sciences M. I. Krivosheyev (NII [Scientific Research Institute[of the Ministry of Communications of the USSR).

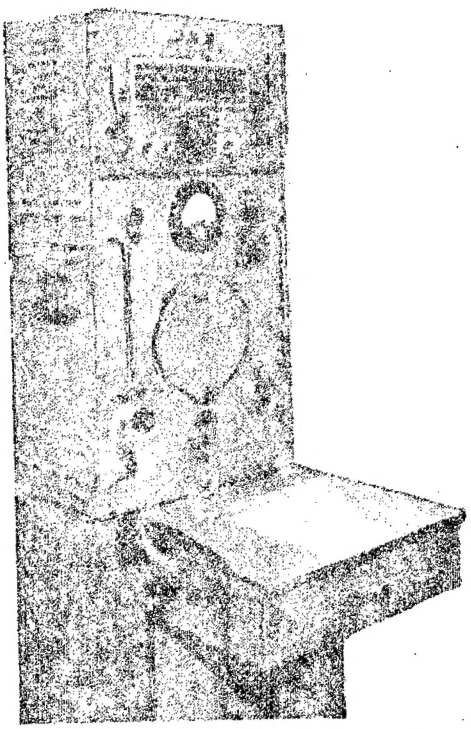
AUTOMATIC REMOTE-CONTROL APPARATUS FOR PROCESSES MEASURING THE ELECTROACOUSTICAL CHARACTERISTICS OF RADIO BROADCASTING STATION CHANNELS

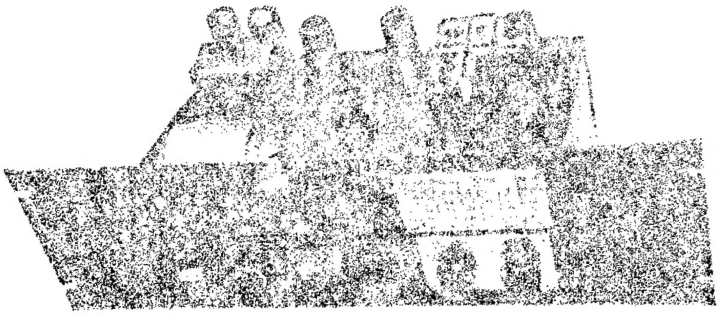
This automatic apparatus permits direct measurement from the radio station of the frequency response, coefficient of nonlinearity, and the noise level of radio broadcasting channels from the equipment room to the transmitter output.

The device is controlled by coded signals formed by a telephone dial located at the radio station.

Using the coded signals, a required fixed audio frequency can be selected (for measuring the frequency response); the audio oscillator is located in the equipment room. Any required filters can also be switched in (for measuring the nonlinearity), the line can be shorted (for measuring the noise factor). The execution of a command is recorded by the signalling system of the installation. The code used is very easy to remember.

The automatic remote-control apparatus was developed by the operating personnel of the Radiobroadcasting equipment room of the Leningrad radiocommunications and radiobroadcasting directorate.





* * * * * * * * * *

UKV (ultra short wave) UNIT FOR A TRUNK-LINK RADIO RECEIVER

Senior engineer A. Ya. Stukman of the Leningrad directorate of communications and radiobroadcasting laboratory developed the UKV unit for trunk communications receivers, intended for use on experimental radio links using ionospheric scattering.

Theuumit was designed with an eye to obtaining the minimum noise level; it consists of a converter for the

meter band (from 32 to 45 Mc) with IFs of from 2.5 to 5.5 Mc.

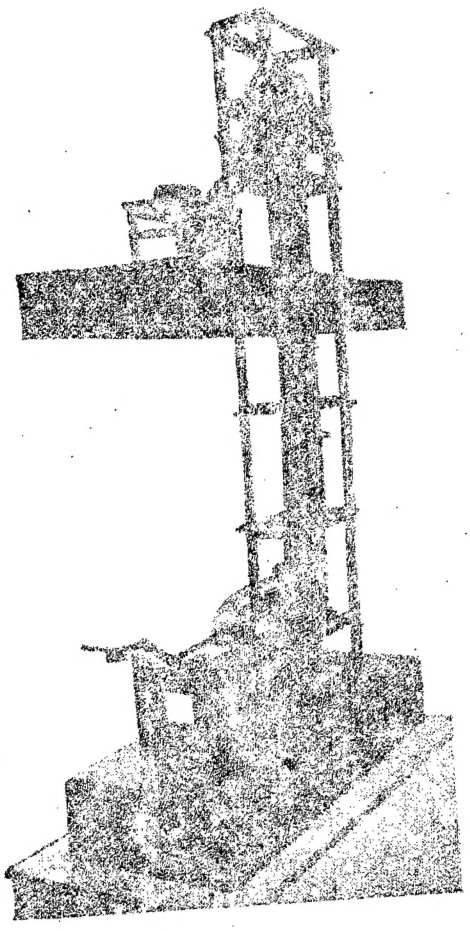
The unit uses a symmetrical antenna input, designed for standard 208-ohm receiver feeder; the output goes to a coax connector, whence the IF signal goes to the input of the communications receiver.

* * * * * * * *

ELEVATOR FOR LIFTING PARCEL CONTAINERS

In the Kiev post office, an eight-bucket one-direction chain elevator has been installed. It is used to lift empty parcel containers from the second floor to the third. Using the elevator, 720 containers can be raised in an hour's time.

The proposal to construct the elevator came from P. I. Korepanov and M. A. Fridman, workers in the postal technology laboratory of the Kiev post office.



2112

END